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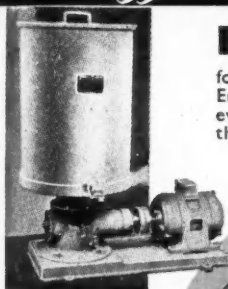
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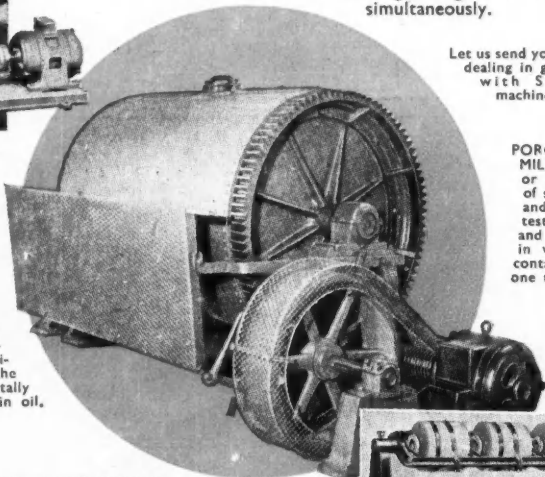


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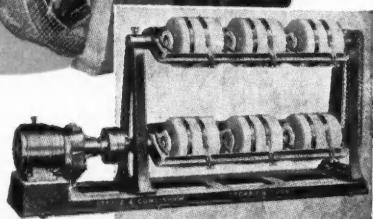
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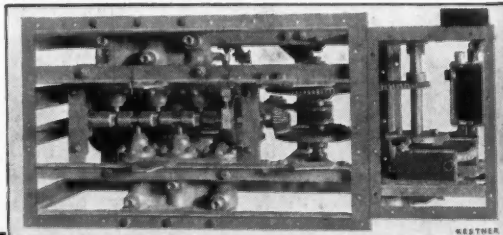
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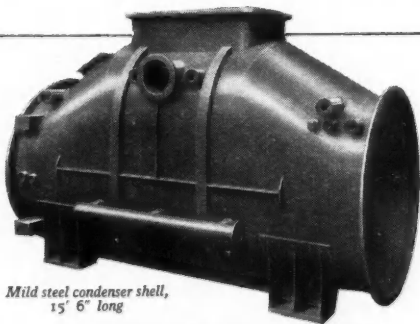
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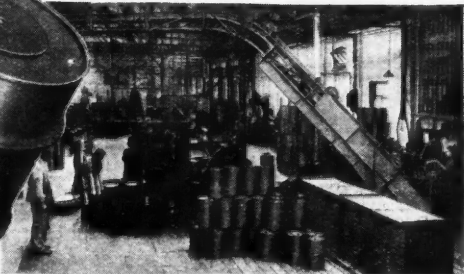
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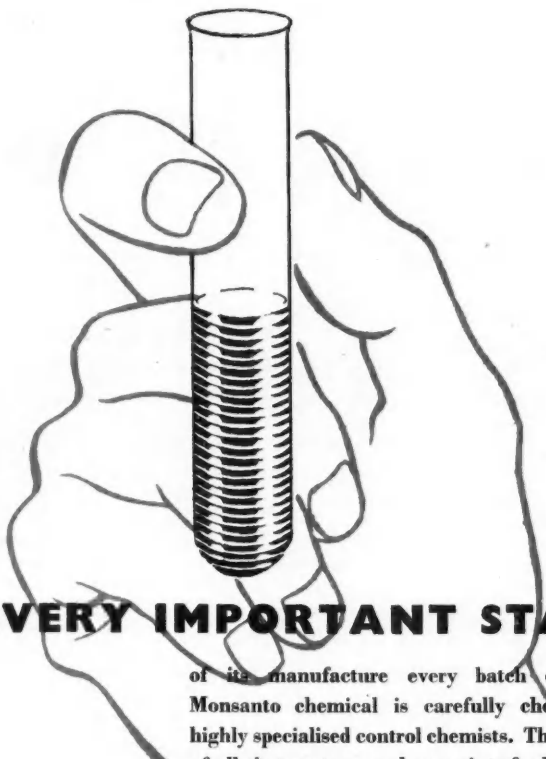
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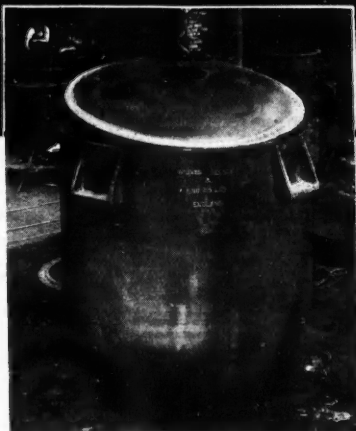
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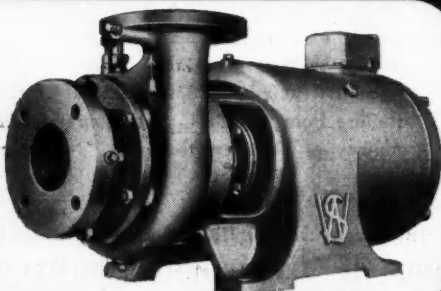
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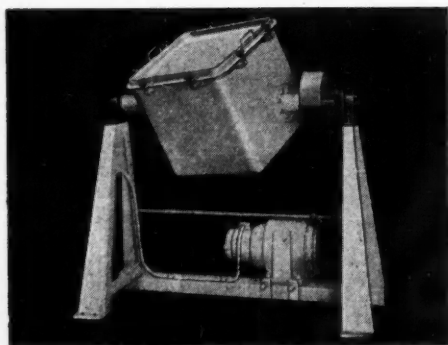


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A Creed for Chemical Engineers

THOMAS CARLYLE declared that there were three basic elements of modern civilisation: Gunpowder, Printing and the Protestant Religion. To these Mr. H. W. Cremer in his presidential address to the Institution of Chemical Engineers added a fourth, which can be conveniently described as Uglification—the infliction of scars upon the landscape, the pollution of air and rivers, the broadcasting of dirt and the destruction of vegetation. These are the common consequences of industry. The fashion for laying waste our beauty spots in order to build a factory was started quite early in the industrial revolution, when industry was young. Industry has now come to years of discretion and it is time, in Mr. Cremer's view, that it grew up. Work is far more pleasant when conducted in pleasant places; since we spend most of our waking life at work, why not provide surroundings agreeable to ourselves and inoffensive to our neighbours?

In making this plea, Mr. Cremer supports a point of view that has been advocated often in these columns. There is no sense in building dismal and unsightly factories when they could be pleasant and attractive. There is no merit in levelling every tree and shrub, when by taking a little thought they could be preserved to form the nucleus of amenities of the new works. The bulldozer is the ultimate product of thoughtless industry. In its right place it is indispensable; but it should be used with circumspection if it is not to rank as an implement of barbarism.

For the chemical engineer there is, at least potentially, a unique rôle in the civilisation towards which we are groping. He is unfortunately distrusted a little by some other engineers—mechanical, civil and electrical; the gas engineer is, of course, a chemical engineer. The chemical engineer, upon whom the outward appearance and reputation of chemical industry so largely depend, must clearly remove that suspicion by showing that he knows quite enough about engineering to be accepted into the family. He is not invariably accepted by the chemist, but he is more readily accepted when he speaks the same language. The chemist is prone to forget that the chemical engineer is the greatest ally he has.

The engineer has little knowledge, and less patience, with chemical formulae. His rôle is to translate chemical formulae into plant, machinery and buildings, but, having an engineer's mind, he is most interested in the mechanical working of the machinery and in the stability of his buildings. It is the chemical engineer who bridges the gap. Inability of pure and applied science to speak the same language can be a tremendous handicap to any firm and to any industrial nation. The chemical engineer should be the unifying force and the interpreter. His contact with science gives him habits of thought that cause him to reason from first principles. His influence should never be diminished.

But because of the need to preserve the amenities, to understand chemistry and physics, to speak with "real" engineers

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in the gate and not be ashamed; chemical engineers' training is long and the profession is not receiving recruits on an adequate scale. "A most embarrassing dearth of chemical engineers" was the description applied by the chemical engineers' president. How that is to be remedied we hesitate to say. On the one hand we must not over-produce, or chemical engineers will become two-a-penny; on the other, the profession must be upheld. That can be done by the chemical engineer himself. He would have a unique part to play in public enlightenment—if he would put his special knowledge and gifts to the public service.

It has been left for Mr. Cremer to point out that few other professions have

attempted to confer such a grasp of pure and applied sciences and appreciation of good and bad in practical matters, while requiring of practitioners an understanding of human needs and vision in developing the means of supplying them.

Thus the qualities which we are seeking in the chemical engineer are not common ones. In proportion as he acquires and uses these gifts, gaining thereby the esteem of his fellows in other walks of life, will his shadow wax greater in the land. He must, moreover, not stand on his dignity, for, as the president (quoting Ibsen) said: "One should never put on one's best trousers to go out to battle for freedom and truth."

ALUMINIUM COSTS AND PRICES

IN the course of his address to the annual general meeting of the British Aluminium Co., Ltd., in London, Mr. R. W. Cooper, chairman, made reference to the difficulties which the company was encountering in negotiating with the Ministry of Supply economic prices for aluminium ingot. "Last year," he said, "we accepted a very low price, and we expressed our intention of proceeding with a very extensive reconstruction programme in order that our technique may be preserved and improved for future large-scale development. The price at which we sold our 1947 production was considerably below that at which metal produced anywhere else in Europe can be purchased, and we are in a position to accept an even lower price for 1948."

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put had proceeded since last autumn, and before the end of last year the company had agreed with the Ministry's estimate of what bare costs would be for the current year. So far, however, the Ministry had offered a price which was below this agreed bare cost of production.

Profits Tax Suggestion

The final agenda for the Labour Party Conference, opening at Scarborough on May 17, contains a motion from the combined Scottish Universities suggesting that in cases where companies fail to co-operate in voluntary dividend limitation, the Government should increase the rate of Profits Tax to 100 per cent on distributions in excess of an agreed pre-war standard distribution.

NOTES AND COMMENTS

Phantom Reparations

THE news that 10 more important industrial plants in Germany, of which four are associated with heavy chemical production, have been declared surplus by the Allied authority is likely to be received in some quarters with cynicism. The facts are not in doubt; they are indeed just as authoritative as earlier official statements reproduced here of the other chemical plants in Germany scheduled for distribution among the 18 allied nations, among which this country ranked for a potentially useful share. Equally incontrovertible is the fact that none of the inquiries which we have made has yet brought to light an instance of a British chemical undertaking having received a single item of the reparations we have listed from time to time in the past 18 months. There is a temptation conveniently to assume that such equipment must have been diverted to destinations outside this country; but there is manifestly no evidence that any other nation, including the U.S.A., has received any concrete benefits. This is one of several subjects of considerable importance to industry on which the British authorities consistently decline to cast any light. Meanwhile, news from Germany this week reveals that 5000 applications were received to participate in the distribution of the I.G. Farbenindustrie plant at Ludwigshafen. As usual, nothing was said as to which—if any—of the applicants were successful.

New Field for I.C.I.

EVENTS have conspired with more than usual alacrity to bear out our assumption ("Notes and Comments," April 17) that the lull in the progress of petroleum-chemical developments was more apparent than real. In the place of the previous absence of news and confirming that the ambitious plans described in 1947 had not remained on the planning board there were the almost simultaneous announcements of very real progress by the Shell and Manchester Oil Refinery groups and the first evidence of how the oil conversion processes may soon complement other industries and confer and receive economic benefits, thus greatly strength-

ening their claim to be given all technical and practical support. The more ample picture of the proportions which this industry may attain in the comparatively near future comes with this week's announcement of Imperial Chemical Industries' well advanced plans for participation in this potentially fruitful field. The project for which the Wilton Works are being made ready for cracking petroleum to provide polythene, acetone and intermediates for the manufacture of detergents and other essentials shares the same inestimable advantage of being designed to work in close conjunction and enjoy reciprocal benefits with the versatile organic chemical plant at Billingham.

Soviet Research

WE publish on another page a note on the subject of atomic research in Russia, derived from Spanish sources, including the journal *ION* (February 1948). Assuming the facts and conclusions are fairly reliable, the information manifestly does not extend much beyond the end of 1946, and adds little more than one assumes was known in Government circles in this country and the U.S.A. It was obvious that Russia was far from neglecting this field of research, vitally important in peace or war, disregarding propagandist statements of various colours. It would be strictly in accordance with that country's policy of at least making some pretence of following in the paths of peace that such protestations should be made, so far as the atomic bomb is concerned. The note contains, however, a useful reminder that we cannot comfortably and easily rest on the assumption that we need fear no serious rivalry from the Soviet Union. Russia's unwillingness to take part in any form of international control was indeed highly suggestive that such rivalry might be very real. We have also to remember that atomic research is relatively still in its earliest formative stage, and none can foresee the scope and character of its possibilities. The same applies, of course, to other fields of fundamental or pure science and justifies the hope that some day, instead of rivalry in these great realms of human endeavour and

achievement, we shall have friendly co-operation in using the results at least in the best interests of humanity. It is the common people, whose cause Russia purports to champion, who will suffer most bitterly if they are used otherwise.

Specialisation

IT says much for the fundamental good sense and disinterestedness of the various organisation which have so far offered their views on what constitutes an adequate early education for the scientist and technologist that none has made expediency—principally the need to muster more qualified people than the present educational machine is providing—an excuse for disregarding quality. Almost without exception, representative organisations capable of seeing much more than the purely academic view have declared themselves explicitly in favour of giving a much more liberal education before the young scientist renounces the wider horizons for the exacting career of the specialist. It seems almost paradoxical that organisations with pronounced scientific interests should be demanding, as several now are, that the race to impart the utmost science training should be called off, especially by the universities, which fundamentally set the pace. There is now clearly a wide measure of agreement that early training can be a great deal too functional and by the elimination of "inessentials" students are being deprived of most of the influences which

would fit them to apply the very considerable powers scientific training now tends to confer.

Choice of Evils

RECOGNITION that the pure metal of scientific training needs some alloy is now paid by another responsible body, the Joint Committee on Metallurgical Education which represents the five principal organisations of metallurgy, mining and foundry interests. Thus in its newly issued report on qualifications for entrance to university schools of metallurgy this committee urges that in order to qualify for the Intermediate for entrance to universities students should be required to provide evidence of competence in subjects other than science. "It may well be objected," foresees this committee, "that the establishment of such an entrance examination will lower the standard set in the science subjects. This is probably true, but the committee believes, first, that such a lowering would be but a small price to pay for a broader and more balanced culture in metallurgical graduates, and secondly, that, on the completion of the university course, the difference in the standard attained in metallurgy would not be appreciable. Even if it were, the committee is so convinced of the need of supplying industry and the professions with graduates well educated in the full as well as in the specialist sense that it would prefer such a result to a continuance of the present system.

IMPORTANT DEVELOPMENT WORK DELAYED

"AS scientists, we feel extremely frustrated, because we have been told that this country cannot develop our experiments commercially for another twelve months. That is just the difference between this country and America," said Prof. M. Stacey, Birmingham University, Professor of Chemistry, speaking at the recent 10th anniversary celebrations in the city of the Royal Institute of Chemistry.

Earlier he had disclosed that a new range of compounds, which included non-inflammable lubricants, had resulted from the work of a group of scientists at Birmingham University. He added that they were likely to be extensively used in industry and commerce.

Prof. Stacey said the discoveries were the

outcome of State-aided research, done in secret during the war in connection with the Government's atomic energy programme. The element concerned was fluorine, which was highly volatile and twenty times more poisonous than strychnine. Although the possibilities of fluorine by-products had been known to science for many years, it had been dangerous to handle, and some experiments had had lethal consequences.

Great interest had been aroused in Great Britain and the U.S.A. by the discovery of new products from uranium and fluorine, and work at the University had now succeeded in making fluorine processes harmless. One, "the Birmingham process," was outstandingly efficient and possessed "tremendous industrial potentialities."

I.C.I. PETROLEUM CHEMICALS

Wilton and Billingham Plants to Collaborate

NEWS of "a major new manufacturing installation at Wilton to crack petroleum to give a maximum yield of the simpler olefins which will serve as the starting points for the manufacture of a large range of more complicated organic materials" has been provided this week by Dr. J. W. Armit, of the Wilton Works of Imperial Chemical Industries, Ltd. The project is associated with ICI's more immediate development of the Wilton Works for the processing of Perspex and synthetic resins, of which Dr. Armit records: "Considerable progress has been made. In spite of the delays which have been incurred on this as on almost all other development schemes in Great Britain in these times such general service installations as stores, workshops and boiler plant required by production activities at Wilton are already far advanced. It is hoped that the first chemical plants will be in production before the end of this year. These plants will make 'Perspex' sheet and phenolic moulding powders, products already being made by ICI at other factories. The erection of an electrolytic caustic soda and chlorine plant has also been approved."

"After this initial production activity there will be a time interval during which the construction engineers will be very busy before the major new manufacturing installation at Wilton comes into operation. This installation is a plant to crack petroleum to give a maximum yield of the simpler olefins which will serve as the starting points for manufacture of a large range of more complicated organic chemicals."

Solvents and Detergents

"In these days of world food shortage the agricultural route to organic products must be regarded as severely restricted. The working-up of coal for organic products is only attractive under very special conditions. Great advances have been made in oil technology, and oil at present affords the most convenient, versatile and flexible source of organic chemicals."

"Ethylene will be polymerised to polythene, the outstanding electrical properties of which are well known and for which a large market is foreseen. Propylene will be worked up via isopropanol into acetone, a solvent and an intermediate for which there are large demands both inside and outside the company. Both ethylene and propylene can be processed into intermediates for the manufacture of high-grade detergents which

are of particular interest in the world to-day when fats are scarce."

"The Wilton Works are near to Billingham where organic chemicals are already made on a very large scale. At Billingham the basic raw material is coal, and much of it used in the form of coke and creosote. The two major organic products are petrol and methanol. Billingham and Wilton in this matter of organic chemicals will be indispensable one to the other. Three examples can be quoted: first, plant is available at Billingham which with little adaptation will be suitable for the conversion of Wilton propylene into isopropanol; second, the operation of the Wilton cracker gives petrol as a by-product and this petrol can be handled advantageously at Billingham with their petrol obtained by hydrogenation; third, the methane-hydrogen fraction from the Wilton cracker gases will find a ready use at Billingham to replace part of the coke used there to make hydrogen for ammonia, methanol and petrol production."

Long Pipeline

"Means must accordingly be provided for the transfer of gases and liquids between Billingham and Wilton, a distance of six-and-a-half miles as the crow flies. A suitable route for a pipeline system has been worked out in collaboration with the owners and statutory authorities responsible for the land and river between the two factories. The route avoids built-up areas and crosses the River Tees near Teesport. Crossing by means of a bridge was first considered but the idea was abandoned, and instead the pipes will be carried in a 1750-foot long tunnel under the river bed."

"Work on the tunnel, and on a causeway to support the pipes over Seal Sands on the north side of the river, has been going on for over a year and is well advanced. The tunnel provides room for future increases in the quantity of products to be moved between the two factories."

"An interesting detail of design is that the tunnel and shafts are of such a size that the same standard sizes of cast iron linings as used in London's Underground can be employed. As the pipelines run it will be a distance of nearly ten miles from Wilton to Billingham."

"The inter-dependence of activities at Billingham and Wilton is well demonstrated in the manufacture of Perspex. Perspex

(Continued Overleaf)

Gas Turbines in Chemical Processes

Director's Views on Future Developments

SPEAKING at a Press reception held at the Waldorf Hotel, London, last week by Power Jets (Research and Development), Ltd. Mr. W. E. P. Johnson, executive director of the firm, dealing with the application of the gas turbine engine to the chemical industry said, "It is not too visionary to predict that the production of cheap oxygen from which a whole revolution of industry may spring, will turn largely on the application of current gas turbine research and development. Cheaper steel, cheaper coke, cheaper and more available fertiliser, cleaner industry, better transport, are all targets within the range of the gas turbine."

"I am fairly certain of one thing as a matter of personal opinion, and that is that what we call the process gas turbine shows greater prospects of quick dividends than do the more obvious and more easily understood power applications."

Unique Characteristics

Mr. Johnson said that the gas turbine as an engine was unique in two ways. First, because in it the three essential functions in a heat engine—compression, heating and expansion—were analysed into three organic units and, second, because it was the most universally applicable prime mover yet devised.

In relation to its peculiar three-functional analysis, while this was not at first sight a very spectacular attribute, it should be remembered that any improvements introduced in any one of the three fundamental organs were available to other industrial products involving such organs. For example, an advance in compressors became available not only to gas turbines but to compressors as such, for whatever purpose a compressor may be required. The technology of gas turbines was extremely catholic and should be of the greatest interest to specialists in compressors, and the same view applied to the combustion of fuel, turbines, heat exchangers and metallurgy. The gas turbine was a compendium of technology.

Turbines in Industry

The speaker said that the development of the gas turbine brought within range a prime mover applicable not only to high speed aircraft and electrical generation but to such vital industrial processes as blast furnace operation and gas liquefaction.

After pointing out that Power Jets controls about 2000 patents and applications in 15 different countries, the speaker said

that the system of patenting abroad opened the door for British exports, since it prevented the acquisition by competitive interests of patents which might frustrate our own national efforts. This country had in the past too frequently acted as unpaid tutors. His company did not intend to perpetuate that error.

"Minor Industrial Revolution"

The Minister of Supply, Mr. G. R. Strauss, who also spoke at the reception, said that the company, which was owned by the Government and controlled in policy matters by the Ministry, was developing, in the gas turbine engine, a technical unit that might herald "a minor industrial revolution."

On exhibition at the gathering were diagrams and scale models showing the applicability of the engine to nitric acid production.

I.C.I. PETROLEUM CHEMICALS

(Continued from page 607)

was first made at Billingham and is now also produced in several other I.C.I. factories. The demand for this material is such that it is now necessary to build a new plant at Wilton with the most up-to-date equipment.

Only the final process in which the liquid methyl methacrylate monomer is polymerised to give sheets of Perspex will be carried out in the Wilton plant. The monomer will continue to be made at Billingham from acetone, methanol, hydrocyanic acid and sulphuric acid. The acetone will be made at Billingham from propylene made at Wilton and piped to Billingham. The hydrocyanic acid will be made at Billingham from ammonia and methane, the latter partly coming from oil cracked at Wilton. The ammonia and methanol will be made at Billingham also partly from Wilton's mixture of methane and hydrogen. The sulphuric acid will be made from anhydrite mined by I.C.I. at Billingham."

New Products

"The above outline deals only with the first step in the development of the Wilton works. These works will accommodate many of the plants for new products from I.C.I.'s research laboratories as well as extensions of older manufactures for which space in factories is now more difficult to find. The Wilton site is large, flat and well-situated and construction work should proceed on it along with increasing production for many years to come."

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LARGE EXPORT INCREASES

Chemical Total £1,269,000 More than Last March

CHEMICALS exported from the U.K. in March were worth half as much again as the total return a year ago. This is one of the outstanding features of the month's Trade and Navigation Accounts (HMSO, 4s. 6d. net), showing that the total return for chemicals (excluding drugs and dyestuffs, etc.) exported in March was £3,695,151, contrasting with £2,426,252 in the same period a year ago. Detailed comparison on the same basis shows that in many categories the volume of exports were doubled. Increases of that order were recorded, for example, by salicylic acid (to 107,814 lb.), nitrocellulose (1983 cwt.), salt (16,671 tons), while much larger increases were achieved in several departments, such as heavy coal tar, anthracene and similar oils (259,374 to 2,856,240 gal.) and sodium carbonates (71,631 to 312,354 cwt.). Elsewhere there were many moderate increases in export volumes and many fewer reductions.

Among the few large recessions in March, contrasted with a year before, were chloride of lime, approximately halved at 21,219 cwt.; and glycerine, reduced by four-fifths at 336 cwt. Shipments of disinfectants, insecticides and weedkillers were also on a reduced scale.

Chemicals from Germany

The generally enlarged figures appear to have been characteristic of a wide increase in chemical trading activity, reflected in large increase in the value of imported chemicals, from £1,581,529 in March last year to £2,915,631 last month. Shipments from the U.S.A. were substantially more than twice as large at £897,200; Belgium's contribution (£479,306) showed a somewhat larger increase. Even more interesting were the increases registered by imports from the Netherlands (£20,534 to £312,668) and, in particular, from Germany (£569 to £273,970).

CHEMICAL EXPORTS

	March 1948	March 1947
	Cwt.	Cwt.
Formic acid	3,239	2,716
Tartaric acid	713	311
	Tons	Tons
Aluminium oxide	666	3
Sulphate of alumina	1,960	1,319
Ammonium sulphate	13,336	12,168
Ammonium nitrate	8,140	5,377
	Cwt.	Cwt.
Bleaching powder	21,219	47,567
Calcium carbide	2,006	2,103
	Gal.	Gal.
Benzol	186	2,770
Cresylic acid	184,845	145,468
Tar oil, creosote, anthracene oil, etc.	2,856,240	259,374
	Cwt.	Cwt.
Naphthalene	3,560	2,224
Nitrocellulose	1,983	596

Disinfectants, insecticides, weed-killers, etc.	52,667	63,062
	Tons	Tons
Copper sulphate	3,900	3,192
	Cwt.	Cwt.
Glycerine	336	1,046
Nickel salts	4,248	3,312
Lead acetate, litharge, red lead, etc.	11,603	5,036
	Tons	Tons
Magnesium compounds	912	554
	Cwt.	Cwt.
Potassium compounds	9,588	6,983
	Tons	Tons
Salt	16,671	8,967
	Cwt.	Cwt.
Sodium carbonate	312,354	71,631
Caustic soda	186,965	137,238
Synthetic sodium nitrate	2,002	11,164
Sodium silicate	12,924	3,761
Sodium sulphate	4,327	55,781
Tin oxide	777	1,004
	Tons	Tons
Zinc oxide	943	680
Total value of chemical manufactures, excluding drugs and dyestuffs	£3,695,151	£2,426,252
	Oz.	Oz.
Quinine and quinine salts	87,308	119,788
	Mega units	Mega units
Penicillin	326,857	112,771
	100 international units	100 international units
Insulin	363,151	264,064
	lb.	lb.
Acetyl-salicylic acid	63,402	135,394
Total value of drugs, medicines and preparations	£1,226,041	£1,141,197
Total value of dyes and dyestuffs	£627,607	£636,033
	Cwt.	Cwt.
Chemical glassware	1,597	1,118
Value	£49,488	£39,059
	Tons	Tons
Furnace plant	570	271
Value	£84,532	£55,988

CHEMICAL IMPORTS

Acetic acid	15,691	16,368
Boric acid	10,760	2,600
Tartaric acid	—	3,000
Borax	64,020	7,937
Bromine and bromides	852	1,227
Calcium carbide	12,391	—
Coal-tar products (excluding benzol and cresylic acid)	5,134	1,001
	Tons	Tons
Ammonium phosphate	—	—
	Cwt.	Cwt.
Manufactured fertilisers	150	402
Potassium chloride	548,966	418,865
Potassium sulphate	32,500	46,240
Other potassium compounds	3,197	3,182
Sodium nitrate	59,820	139,822
Carbon black	90,850	11,392
Total value of chemicals, drugs, dyes and colours	£2,915,631	£1,581,529

Chemical Factory Delay.—A deputation from Sudbury (Suffolk) Town Council is to approach the Ministry of Health in an attempt to accelerate industrial development, which includes the provision of building facilities for Consolidated Chemicals, Ltd., at present held up by the works ban.

More Chemical Reparations

Ten Plants Scheduled

AN additional ten war and industrial plants have been declared available as reparations from Germany and official inventories received in the United States, listing and describing the equipment, indicate that four of the ten plants are suitable for the production of chemicals and chemical products. None of the plants has yet been allocated by the Allied Control Authority, and in the meantime American business firms and citizens have been invited to express any interest which they may have in the purchase of this material in the event of its allocation to the U.S. Government. Four of the principal factories at which plant is scheduled for disposal are Vereinigte Flusspatwerke, Stulln, producing hydrofluoric acid, sodium fluoride and potassium bifluoride; I.G. Farben, Ludwigshafen and Oppau, manufacturing caustic soda, amino plastics and resins; and Raschig, also at Ludwigshafen, producing phenolic plastics. The remaining six plants are in the armament, combustion engine, aircraft and metallurgical fields.

LESS E.R.P. STEEL

SIGNIFICANT cuts in Marshall aid for a number of European countries was announced in Washington last week. This country is to suffer a cut of 189,000 tons in its steel allocations; total cuts amount to 602,000 tons.

With regard to oil supplies, the U.K. will receive 282,000 tons more than was expected three months ago, while other European countries will have cuts involving 2.146 million tons. It has been stated that the effect of the reduced allocations has been materially to improve Germany's position in the programme.

Petroleum Board to End

The Petroleum Board will be dissolved on June 30. An official statement from the Board says that at the request of the Ministry of Fuel and Power, arrangements have been made by the companies to ensure maximum economy in the use of manpower and transport. They have therefore agreed not to introduce branded products for at least six months. Two advisory committees have also been set up by the oil industry at the instance of the Minister to provide liaison between the industry and the Government.

Drugs and Medicines

Advertisement Code Published

A" British Code of Standards " relating to the advertising of drugs, medicines and treatments was published last week after many months of preparation. It is supported by all the principal newspaper and advertising associations and the Proprietary Association of Great Britain.

Comprehensive recommendations require that no advertisement should claim a cure for any ailment or symptom of ill-health, and in no case should offer to treat serious illnesses or complaints. Other provisions relate to misleading or exaggerated claims, appeals to fear, competitions, diagnosis or treatment by correspondence, money-back offers, etc.

The section devoted to special claims for drugs and chemicals reads as follows: "No advertisement for drugs or chemicals should contain any reference which is calculated to lead the public to assume that the article, product, medicine or treatment advertised has some special property or quality which is in fact unknown or unrecognised."

£500,000 DISTILLING PLANT

A CONTRACT from the Netherlands Government worth £500,000, payable in U.S. dollars, has been secured by G. & J. Weir, engineers, Holm Foundry, Cathcart, Glasgow. Under its terms plant to distill fresh water from sea water will be installed in the Dutch West Indies. Practically all the work will be done in the West of Scotland. This valuable export contract is the largest single order the firm has ever received. The distilling plants are to be erected at Curacao and at Aruba, the island sites of extensive oil-refining activities, where G. & J. Weir have built a number of installations in the past 25 years.

The boilers and plants will be made at Renfrew by the Babcock & Wilcox company and the structural engineering work will be carried out by A. & J. Main & Co., Glasgow, under the supervision of G. & J. Weir, who will make the evaporating and distilling plants.

Glasgow Business Change.—William Baird and Co., Ltd., which has wide interests mainly in heavy industry, has acquired a substantial interest in the Brown and Adam, Ltd., bleachers, dyers, and finishers, Riverbank Works, Pollokshaws, Glasgow. The latter business dates from the 'fifties of last century and is one of the leading undertakings in the area.

RESEARCH ON CEMENT

New Italian Theories of Composition

by W. G. CASS

IN an earlier paper, A. Rebuffat has discussed the significance of the hydrolysis number in cement or clinker analysis (*Chim. d'Ind.*, 1948, 59, 22-29; *THE CHEMICAL AGE*, March 27). In a further study he deals with some new ideas on cement composition (*loc. cit.* pp. 240-246) based on his own research and that of his father, the results of which have been already published in part in the Italian technical Press and formed subject matter of papers read at the 20th Congress of Industrial Chemistry, in Paris.

It is argued that the facts about cement composition differ in some respects from views hitherto held, and an attempt is made to elucidate more particularly the rôle of the silicates. Two points are stressed: first that iron is combined with silicated forms, and second that a zeolitic structure is to be found in any hydrated clinker.

In cements of 59.61 per cent lime content no more than 15 per cent silica may be found—much less than would be required if all the lime were combined as tricalcium silicate.

The amounts of free lime and its combined forms at any stage of roasting, in the resulting clinker, or in the hydrated cement, require special study. The questions involved are treated at some length in relation to three samples of Italian cements—Merone, Calusco, and Colleferro, analyses of which are given.

Chemical Composition

The author considers it a matter of fundamental importance that, in samples of normal composition properly roasted, no evidence could be found of the pre-existence of dicalcium silicate, $\text{SiO}_2\cdot 2\text{CaO}$. It is concluded that, in these Italian samples, average composition was 40-45 per cent tricalcium silicate, 35-45 per cent aluminosilicate—with some alkali and magnesia in the pouzzolanas, 5-7 per cent calcium silicoferite, small amounts of quartz and non-hydrolysable silicates in Portlands, and iron occasionally present as brownmillerite.

It is well known, of course, that samples of similar composition may have widely differing setting or hardening rates. In this connection the diluent action of tricalcium silicate, the alumina content, zeolite formation in two stages, and the mode of clinker formation, are considered.

Starting with a ternary compound: silica-alumina-water of constitution, complex reactions of substitution and addition

take place. Reference is made to earlier work of O. Rebuffat (Snr.), which showed, among other things, that kaolinite during dehydration acquires marked chemical activity, with non-formation of metakaolin.

The author regards some of the phenomena here as inexplicable on orthodox grounds and presents a new theory to account for them, based on the existence of two distinct phases—silica and alumina—in close contiguity but independent, and the replacement of the atomic bridge in the structure by the molecular water (or hydroxyl?) bridge.

There appears to be no difficulty in supposing that the silica and alumina are united by the bond: >OH-O-HO< with co-valences in action. It is thought that the roasting curve of a kaolin, showing changes which are irreversible, should explain much. The name Silal is proposed in place of metakaolin, and hydrosilicates of alumina become simply Hydrosils. Thus, considerable gain in clarity and an explanation of the facts are conveyed.

General Formula

It is thus possible to go more deeply into the constitution of certain silicates, and Rebuffat in collaboration with a mineralogist is pursuing this line, and hopes to publish results in supporting data. In connection with the Silal idea reference may be usefully made to the work of Weyer (*Zement*, 1931, 96, 264, 560) and of O. Rebuffat (*Gazz. chim. Ital.*, 1902, et al. bib. refs. in original).

It appears that the raw material used in Italy (lime-stones of Montferrat and lime-kaolin mixtures) yield quick-setting cements when roasted at temperatures not exceeding 800°C . Owing to the large number of naturally occurring calcium aluminosilicates there is the greater probability of the production of ternary products in the kiln.

As Weyer had noted there is diffusion of lime into the silal, taking the place of water and probably reaching saturation point, so that the products would have the general formula: $m\text{SiO}_2\cdot n\text{Al}_2\text{O}_3\cdot (2m-3n)\text{CaO}$. As to whether a true ternary compound or only a mixture is thus formed, the author considers there is little doubt that the result is a molecular crystalline aggregate, although still more basic ternary compounds may sometimes be formed, as in Italian cements of the Merone type.

Liquid Purification Plant

Liverpool Gas Project Approved

THE Ministry of Fuel and Power has authorised the Liverpool Gas Company to install at their Linacre Works, which has a capacity of 20 million cu. ft. of gas per day, a liquid purification plant capable of dealing with 4.5 million cu. ft. per day.

The plant, for which a tender by W. C. Holmes & Co., Ltd., has been accepted, is based on the Manchester process and is being installed so that its behaviour with various types of gas can be studied. If necessary, experiments can be carried out to modify it to suit all the conditions. The site chosen for it is extremely suitable for this purpose, and allows the plant to be supplied with 4.5 million cu. ft. per day of: (a) Straight horizontal gas; (b) horizontal gas plus producer gas, (c) gas from continuous vertical retorts, or (d) carburetted water gas.

The plant is arranged so that at a later date a catalytic organic sulphur removal plant can also be installed. Initially the plant will be followed by oxide purifiers, the

installation of which was extensively damaged in the war, but will still be serviceable for the anticipated experimental period.

The company considers that apart from the savings in material used in constructing these wet purification plants, the improvement in working conditions for the operatives and local atmospheric conditions should be sought since there are so many works sited in built-up areas. If the plant is found to be completely successful under all the conditions, the existing boxes can gradually be scrapped and much valuable works space will be recovered. This will be a great asset when considering future development schemes, as the box system of purification occupies a high percentage of the works area. It is quite possible that the necessity to obtain new sites can be avoided. The company adds that, as the information that this plant will give is of vital importance, its construction is being pursued with the utmost speed.

CEMENT—(Continued from previous page)

In seeking some explanation of this latter case reference is made to the Kuhl and Lorentz diagram reproduced by Dorsch (*Chemie der Zemente*, Berlin, Springer, 1932) which is here again shown and discussed at considerable length, in conjunction also with other literature references, and with particular regard to lime absorption up to a temperature of 1250°. Tables are given to show various states or models of polymerisation, and some effects of the presence of iron are noted.

Rôle of Iron

B. Tavasci, another Italian worker, using mixtures including ferric oxide, produced some samples by simple roasting at 1180-1190°C. (*Ann. chim. applicata*, 1936, 26, 7; 1937, 27, 2); but his diagrams, like others, are only valid, says Rebuffat, if one starts with mixtures of oxides or if these are formed in course of roasting. If this is not so, equilibrium may no doubt be obtained temporarily but of a varying kind. These experiments, however, appear to confirm the rôle of mineraliser attributed to iron. The silico-ferrite of lime surrounds the free lime and contacts it with the bicalcium silicate, which is thus completely transformed—if there is sufficient lime—into crystalline tricalcium silicate.

Over roasting must, of course, be avoided, and various effects of this are indicated. For example, O. Rebuffat (Sen.) and V. Mazetti (*Atti R. Ist. Incoraggi. Napoli*,

1930) showed that over-roasted clinker when slowly cooled fell to powder, from which, by simple sifting, they obtained prismatic micro-crystals of composition corresponding to: $4(\text{SiO}_2, 2\text{CaO}) + \text{Al}_2\text{O}_3, 3\text{CaO}$. It should be possible, starting with suitable materials, to produce natural aluminosilicates under atmospheric pressures and a sufficiently prolonged heating at definite temperature.

Although, as already intimated, two clinkers may have practically the same percentage composition, they may differ in quality according to the amount and nature of the calcium aluminosilicate, amount of tricalcium silicate, and presence of bicalcium silicate. The author says he has made no reference to the petrography of clinkers, and does not agree that only the polarising microscope can solve the problem of cement composition.

Further Prospects

No reference is made to Bragg's X-ray studies of silicate structure; but it is suggested that new structure models are doubtless required, and work on the lines of that of Weyer might well be continued.

The existence of a very basic aluminosilicate capable of reacting with water has suggested the idea that, in the formation of natural zeolites through hydrothermic action, one may postulate the pre-existence of a very basic aluminosilicate of probably magmatic origin followed by action of water; and is indeed supported by geological evidence. It is admitted, however, that these ideas are largely theoretical.

Metallurgical Section

Published the first Saturday in the month

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Metallurgical Section

1 May 1948

METAL CLEANING PROCESSES—IV

Solutions, Safeguards and Equipment

By L. SANDERSON

PETROLEUM distillates, when used as cleaning agents, necessarily involve an element of danger. The equipment must be fully earthed so that there is no likelihood of sparks caused by static electricity. The covers of the tanks in which the distillate is contained should be made to shut automatically by the operation of fusible controls. Electric motors working in combination with the cleaning equipment must be fully proofed against explosive gases, and the wiring must similarly be protected. Adequate ventilation if, of course, essential and the dampers in particular must be well designed. Safety doors and a powerful automatic sprinkler system are essentials. Usually a number of carbon dioxide vessels are effectively linked with an automatic device to blanket the area of the fire with a vapour in which combustion is impossible.

This business of preventing fire is the only real difficulty in cleaning with these distillates. The work is dipped or sprayed with the distillate, drained, and dried by an air blast. These cleaners should, however, never be used for purposes other than those outlined in the previous article

Emulsifiable Cleaners

The advantages of the emulsifiable cleaners are that they do not set up corrosion or stain most kinds of work and they can be used for a number of purposes. The principle of their employment is a penetrating and dispersing agent soluble in oil. This agent is mixed with paraffin or a safety solvent in the proportion of 1:10.

Approximately 30 seconds' immersion suffices for cleaning, and the work is then rinsed in a cold water spray to eliminate the residual dirt-holding cleaner. The solution, in effect, forms an emulsion with the water in which the minute dirt particles are held in suspension. The small amount of solvent which may remain rapidly volatilises, and has no injurious effect on subsequent painting or lacquering.

The type of surface produced is physical, but not chemically, clean, and is

therefore better than is obtained when a solvent degreaser is used. It is not necessary to wipe it by hand or immerse it in a solution of alkaline type, save when the work is later to be plated or vitreous-enamelled. Emulsifiable cleaners are specially suitable for cleaning work in advance of bonderising, because there is no passivation of the surface.

Emulsifiable cleaners can be used when the work is not suitable for degreasing solvents, or where there is need of a cleaner surface than the latter provides. If an alkaline solution has not succeeded in removing specially tenacious dirt, they are often successful. They can be employed at normal temperature or slightly warmed, and therefore no expense in heating is involved, except, perhaps, when hot water rinsing is adopted to accelerate the drying of the cleaned work.

Such cleaning agents combine many of the advantages of the alkaline and solvent cleaners, being specially advantageous for removing carbonaceous matter from steel, in which respect they are superior to all other agents. Polished, buffed, heavily oiled, drawn and stamped parts, and those lubricated during machining operations, may all be satisfactorily cleaned in this way without the expense of manual cleaning or brushing.

Washing Machines

Parts that nest or lock together, thereby creating recesses hard to drain or inaccessible to rinsing sprays, must not be treated with emulsifiable cleaners. Deeply recessed work is also unsuitable except when the washing machine enables thorough draining and complete spray efficiency to be achieved. It is, therefore, essential to exercise care in choosing a washing machine.

Such machines constitute an integral unit for cleaning by automatic or semi-automatic means. Not all cleaning operations require to be performed mechanically, but even if no machine is employed, it may be essential to introduce some type of handling equip-

ment. In the following notes the word "machine" covers all kinds of washing equipment from the simple bath or tank to highly intricate plant.

In choosing a machine, the essentials are the shape of the work, its size, and the degree to which it is subject to injury if negligently handled. Shape is of special importance because it may be such that when the parts are mixed together in work baskets, etc., they interlock, and consequently create blind holes.

Should the work be of a type that is readily nicked, channelled or warped, it may not be feasible to employ handling methods that would ordinarily serve quite well for work not so easily indented or distorted. This applies especially to hollow or deeply pocketed work.

Effect of Size

Size necessarily determines the means of handling. Small parts are almost invariably handled in mass, either in work baskets or on trays, particularly if susceptible to injury and according to their shape. Medium-sized work can be dealt with individually by means of flat or chain conveyors, or can be specially held when apt to be damaged. Very large parts are usually conveyed by special conveyors or platforms.

When the number of parts to be dealt with is considerable, making up a large mass, the machine must be chosen in accordance with the conveying method, which itself must suit the shape, size and susceptibility to damage of the work. If only a few parts have to be cleaned, a simple tank and a heating appliance will serve for parts that are small or of medium size.

Pieces of larger mass can be cleaned in larger tanks, heated and provided with overhead hoisting or lifting apparatus, provided the number of parts to be cleaned is small.

Work of considerable size can be sprayed or rinsed under pressure in suitable compartments, or in a corner of the shop furnished with adequate means of drainage.

... And Numbers

Usually flat conveyor machines enable work to be turned out in precise ratio to the width of the belt and the running speed. Barrel-type washing machines produce the work at a rate directly controlled by the pitch of the worm wheel and the number of revolutions per minute.

Where the work has a large superficial area, having considerable mass, it may dry itself out or be rinsed in hot water after it has been cleaned with a hot solution. It will then not be essential to have a mechanical dryer as an integral feature of the

machine, but some mechanical cooling means may be required, without which work will be too hot to handle.

A number of washing machines incorporate in their design equipment not only for washing, rinsing, drying and cooling the work, but also for additional finishing operations, e.g., pickling, ball burnishing, parkerising, bonderising, and even certain electroplating processes.

Heating Methods

The only cleaning agents employed in the cold, or nearly cold state, are the emulsifiable cleaners. The remaining cleaners all need to be heated, and this raising of temperature is achieved by means of steam coils or immersion gas burners, though in the United States it is frequently found cheaper to use oil immersion burners. In some works immersion electric heaters are employed, but only because the cost of electric current in that area happens to be relatively low.

The space that can be provided for installation of the washing machine may have some influence on its choice. Thus, it may be essential to carry out the work by vertical rather than horizontal progression, when little room is available. It is also possible to reduce the amount of space required in other ways, such as by using double conveyors.

In choosing a washing machine, it is always essential to take into account the position of the cleaning process in the series of production operations. The way in which the parts are handled in the production line may not coincide with that given by a machine that would otherwise be suitable. Loading may occur at one end of the machine and discharge at the other; but in certain circumstances loading and discharge may be more effectively carried out at the same end. The manufacturer of the machine should invariably be asked for his advice.

Consideration of Cost

Care in choosing both cleaner and machine can greatly cheapen the cost of the cleaning process. The essential factor is, however, not the cost of the cleaning agent per item cleaned, but the relative cost of cleaning X parts or X square feet. Often an expensive cleaning agent is cheaper in overall cost. A swiftly acting cleaner means that the conveyor can be shorter, the machine smaller, and less heat, power and space are needed. In the same way, an expensive washing machine may be cheaper in the long run.

The degree of cleaning required necessarily influences the kind of washing

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Aluminium Production in Germany

Dependence Chiefly on Indigenous Bauxite

BEFORE World War II, Germany's production of aluminium, which played a very important part in its rearmament drive, showed a continuous and rapid increase. It rose (in thousands of metric tons) from 21 in 1933 to 73 in 1935; two years later, it had leapt to 122, and in 1938, the last full pre-war year, it exceeded with 166 the U.S.A. output (130). In 1943, German aluminium production reached the unusually high level of 320,000 tons, equal to about 60 per cent of world output.

Such development was accompanied by a corresponding growth of the aluminium using industries and a wide range of aluminium articles was produced both for the home and foreign markets. The country was almost entirely dependent on imported bauxite supplies, however, because the development of Germany's insignificant occurrences had made little headway. Germany's output in 1938, for example, totalled less than 20,000 tons, while French production in the same year amounted to more than 680,000 tons, followed by Yugoslavia with 404,000 tons, and Hungary with some 300,000 tons.

A Reprieve

It is not without interest, therefore, briefly to review the fate of the German aluminium industry since the war. The first level of industry plan of 1946 prohibited the production of light metals. The revised plan, however, provides that no light metals plant shall be dismantled for reparation purposes without a further re-examination of the circumstances. This fact, and the recent arrival of 4000 tons of aluminium imported from Canada by the Joint Export Import Agency (a further 6000 tons have still to come), were taken as an indication that a future resumption of aluminium production, and more particularly fabricating, was not

(Continued from previous page)

machine. Many parts are cleaned without great difficulty, but the degree of cleanliness required may necessitate two washings. To provide chemical cleanliness, it may be necessary to have three or even four operations.

The cleaner used affects the choice of machine. For example, emulsifiable cleaners are seldom suitable for deeply recessed or hollow work when it is necessary to spray, though they may be satisfactory for parts cleaned by immersion.

Finally, no single washing machine will solve every cleaning problem.

(To be concluded)

out of the question, especially as the recovery of aluminium from scrap was not prohibited. The latter had so far amounted to 500 to 800 tons per month.

This optimistic forecast has proved to be right, for the ban on the production of aluminium in the joint British and American zones has recently been temporarily removed, probably on account of the need to conserve dollars for the import of goods which could not be manufactured within the country. For the time being, Germany's aluminium production is to be limited by the provision that only domestic bauxite and existing stocks of foreign bauxite, said to total approximately 70,000 tons, may be utilised. Whether or not there will be an ultimate resumption of imports from South-Eastern Europe, France and Italy, is not known. It should be noted, however, that some of these bauxite producers, having lost their best pre-war outlet, have now drawn up plans for the establishment of domestic industries, and implementation presupposes a considerable degree of electrification, chiefly by harnessing hydro-electric power.

In conclusion, it may be added that although war damage and dismantling of plant in the Russian zone have reduced productive capacity to a fraction of its former level, there appears to be sufficient productive capacity remaining to stage a comeback, provided adequate electric power is available and the occupying authorities agree.

U.S. ALUMINIUM & BAUXITE

AMERICAN production of bauxite increased slightly in the fourth quarter of 1947, according to the Bureau of Mines, U.S. Department of the Interior. Imports of bauxite, however, declined substantially, with the result that the net total new supply was lower by 14 per cent. The total output in the fourth quarter was 297,962 long tons and the year's total of 1,215,308 long tons was an increase of 13 per cent on the 1946 figures.

Production of primary aluminium in January this year was 48,767 short tons, an increase of 2 per cent on the preceding month's output. Shipments and use again exceeded production, and stocks of pig aluminium at primary reduction plants further declined to 10,484 tons. There was no indication of a lessening of demand for aluminium during the month, either in the scrap market or in sales of finished aluminium products.

“ A NEW CAST IRON ”

Characteristics of the Nodular Graphite Structure

by J. G. PEARCE, M.Sc., F.Inst.P., M.I.E.E., M.I.Mech.E.*

WHILE improvements have been made in recent years in foundry processes leading to improved mechanical properties of iron castings, there is comparatively little to report with respect to developments of interest to the chemical engineer as such. It is not suggested that improvements in mechanical properties are without significance to the chemical engineer, but these improvements are well treated in the literature and a paper such as the present one should most appropriately deal with problems of resistance to corrosion, erosion and heat and to combinations of these modes of attack which have to be met in chemical engineering service.

Supplying Special Needs

Cast irons required to resist mechanical stress are usually designated as “high-duty,” and irons required to resist chemical attack as “special-duty” irons. Among the latter, the cast irons high in silicon content and in chromium content, Silal heat-resisting iron and the Nomag, Niresist and Nicrosilal austenitic irons, continue to be used.

Just before the war the British Cast Iron Research Association evolved an aluminium cast iron containing about 7 per cent of aluminium for heat-resistance at temperatures up to 950°C. With respect to scaling and growth it proved to be an improvement on Silal. The oxidation of the aluminium during manufacture was prevented by a technique similar to that used in the production of Feralloy. However, the war prevented proper development of this material (Cralfer) on account of the priority demand for aluminium, and it has not yet been effectively resumed.

The British Standard specifications covering cast irons used for constructional purposes, Nos. 321 and 786, are being combined in one specification which enable cast iron to be purchased to specified tensile strengths up to 24-28 tons per sq. in., and no pearlitic cast iron is likely to exceed 30 tons per sq. in. tensile. During the war a shock test was standardised and is now available in B.S.S. No. 1349/47, using the Izod

machine on an unnotched, cylindrical bar 0.798 in. diameter. It is not a test of notch sensitivity and the best pearlitic high-duty irons are not likely to exceed a shock strength of 25 ft. lb. on this basis. The structural character and mechanical properties of engineering cast irons are dealt with in a series of reports I made to the Institution of Mechanical Engineers.¹ The latest development, acicular cast iron,² gives the strongest known cast iron. It is essentially an alloyed and ladle-graphitised cast iron containing molybdenum and either nickel and/or copper. The acicular irons give a tensile strength range of 20-35 tons per sq. in., which may be increased to 25-40 tons per sq. in. by simple thermal treatment, after casting, at about 320°C. The shock strength on the above basis is in the range 25-50 ft. lb. with a Brinell hardness number of 250-400. With these figures in mind, it will be possible to make comparisons with the results of the nodular development, remembering that the figures above mentioned are maxima for their respective classes.

Flake Regulation

All the cast irons hitherto mentioned are grey and machinable in the as-cast state. Their basic metal structure, not itself unlike wrought iron or mild steel, except that it contains more silicon, phosphorus and sulphur, is broken by graphite or free carbon in the form of plate-like crystals of no appreciable mechanical strength.

The difference in mechanical properties between cast iron and other ferrous materials is due in the main to these discontinuities. All irons which are grey in the as-cast condition contain this lamellar graphite, and most improvements have been directed towards diminishing the quantity and limiting the size of the individual flakes. This has been done by modifying charge composition and chiefly by reducing the carbon content, the risk of producing white iron instead of grey iron being offset by the addition to the molten metal of a so-called ladle graphitiser which produces well-distributed and relatively uniform flake graphite. Alloy additions and thermal treatment also serve to improve the matrix without appreciably affecting the graphite.

Obviously, in chemical engineering processes, the larger the amount of total carbon in the metal and the coarser the graphite flakes, the more liable is the metal to attack by oxidising agents, liquid or

**(The courtesy of the Council of the British Cast Iron Association and of the Chemical Engineering Group, Society of Chemical Industry, in granting authority to reproduce this article is cordially acknowledged.)*

gaseous. The coarse graphite structure is mainly responsible for growth under heat and for so-called graphitic corrosion. Hence, refining the graphite flakes should be an advantage, and nodular instead of flake graphite should show marked improvement.

The only alternative graphite structure met in ordinary practice is that obtained by making a hard or white iron casting in the first place and annealing it to yield malleable cast iron.

The British Cast Iron Research Association has recently succeeded in producing a cast iron containing nodular graphite in the as-cast state and this has been accomplished not only many times in the laboratory, but also on an industrial scale for various types of furnace, although the material is not yet in commercial production. The process, is however, fully covered by British, British Commonwealth and foreign patents.

No information is available as yet with respect to its corrosion-resistance, erosion-resistance or heat-resistance as compared with materials in current use and, indeed, only long service tests will give satisfactory

comparisons. Some inferences, however, may be drawn.

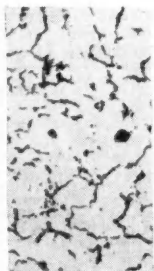
It is important to state that the nodular graphite material is not malleable in the same sense as ordinary malleable cast iron and the material forms a new product between ordinary grey iron and malleable cast iron. The properties of the plain material place it in the high-duty iron class, whereas the method available for the improvement of ordinary grey iron give nodular graphite iron properties beyond any hitherto known in this type of material.

There is no necessity in the present paper to enter into the detailed technique of manufacture or the theory behind the idea^{2, 4, 6, 8} but it consists essentially of the addition of a small and controlled amount of cerium, usually in the form of mischmetal, to the molten metal.

This single simple treatment gives good results, but these are further improved if the cerium addition is followed by a suitable addition of an ordinary ladle graphitizer, by processes well known in the industry, such as ferro-silicon, calcium silicide, or



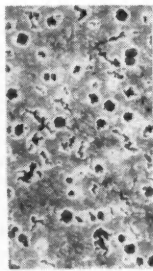
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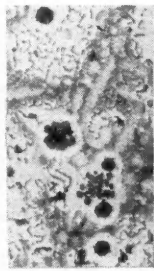
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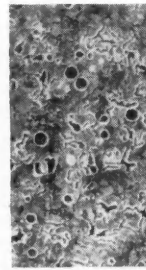
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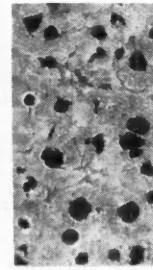
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silico - manganese - zirconium. Tensile strengths obtainable range from 17 to 60 tons per sq. in. and shock strengths from 25 to 120 ft. lb., with a Brinell hardness range from 130 to 500.

The compositions which can be treated are limited. The raw material must be high in total carbon, metallurgically hyper-eutectic, fairly high in silicon, low in phosphorus and low in sulphur. Subject to the above, the process can be applied to metal melted in any form of melting furnace and sound castings in a variety of sections and in heavy sections can be obtained.

The process is applicable to any grade of machinable cast iron, irrespective of the nature of the matrix—ferritic, pearlitic, austenitic, martensitic, or acicular—and the metal can be poured into any type of mould. It can subsequently be treated thermally if required for stress relief, softened for easy machining, or submitted to ordinary heat-treatment processes. Any normal alloy addition can be made.

Improved Properties

Some illustrations can be given to indicate the nature and magnitude of the improvement obtained. Simple experiments with respect to heat-resistance have shown that under oxidising conditions nodular iron, as would be expected, resists growth much better than flake graphite iron, and a similar result might be expected with respect to corrosion.

The austenitic irons lend themselves particularly well to treatment as the restriction mentioned above with respect to carbon content is removed. In view of the demand for austenitic irons of improved mechanical properties, the process should be of interest in this connection. The Silal heat-resisting irons containing 5.6 per cent silicon lend themselves admirably to the process with some improvement in mechanical properties. The high silicon 12-16 per cent, acid-resisting irons may also be treated, though the graphite is not necessarily obtained wholly in the nodular form.

To control the amount added and the amount remaining in the metal, it was necessary to work out analytical methods for the determination of cerium in cast iron and this has been done.

The damping capacity of nodular cast iron is lower than that of ordinary cast iron, as would be expected, and the electrical resistivity is also rather lower, and is about four or five times that of wrought iron or mild steel.

As far as practical tests are concerned, it is possible with a little experience to say from the fracture of the cast iron whether it has been nodulised, and a properly nodulised material has a pronounced ring when

struck, which is quite different from the dead tone of an ordinary cast iron. The microstructure, of course, is an infallible test, as it reveals the nodular structure.

Fig. 1A shows an ordinary cast iron with flake graphite, etched to show the pearlitic ground mass. Fig. 1B shows the similar flake graphite structure of an austenitic iron, unetched. Fig. 2A shows the same iron (1B) with a limited cerium addition by which the graphite has been changed from a flake type to a pseudo-nodular type yielding a higher strength. Fig. 2B shows the same iron with the graphite more fully nodulised. The respective tensile strengths of 1B, 2A and 2B are 8.2, 16.3 and 26.6 tons per sq. in. Fig. 3A shows a hematite iron in the untreated state, i.e., before nodulising, and Fig. 3B the same iron after simple cerium treatment. Some of the graphite is nodulised, but none of it is flake. The production of completely nodulised structures is accomplished by the double treatment, shown in Fig. 4A. Fig. 4B shows a similar iron with 2 per cent of copper to yield a pearlitic structure, giving 46.4 tons per sq. in. tensile. Fig. 5A shows an iron single-treated, of a composition approaching that of Silal (which is normally 5.6 per cent silicon) and Fig. 5B the effect of single treatment on an acid resisting high silicon iron.

(To be continued)

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Lead Mine May Re-Open

The possibilities of re-opening a lead mine at Tre Castell, near Conway, once considered one of the richest producers of lead ore in North Wales, are being investigated. The mine, located at the foot of Tal-y-Fan, has been unworked for thirty years, and the main shaft had been driven down to 600 ft. when work was abandoned. According to Mr. Sidney Kitchin, general manager of Tre Castell Mines, Ltd., the workings are flooded, and the first task will be to pump them dry. If the lode comes up to expectation the mine will be re-opened as the present price of £100 a ton would make it a profitable undertaking.

Behaviour of Bent Stanchions

Summary of Nine Years' Study

INVESTIGATIONS into the behaviour of stanchions bent in double curvature, which Prof. J. F. Baker has been undertaking over a nine-year period—first at Bristol University, but latterly at the Engineering Laboratory, Cambridge, formed the subject of a report published in the official organ of the B.W.R.A. (the *Welding Research* supplement of the *Trans. Inst. Welding*).

The object of the investigation was to determine experimentally the true load-carrying capacity of members in rigid frameworks, and subsequently from the data obtained to develop a rational design method. Success depends upon understanding the fundamental behaviour of structural members in the plastic range of the material, in order that the real strength of a rigid structure may be calculated. Earlier work provided this information in the case of stanchions bent in single curvature.

While the application of the information obtained from the investigations into the problem of double curvature bending is not restricted to welded structures it is, nevertheless, of particular significance to this type of construction, since joints possessing a high degree of rigidity may be produced most simply by means of welding.

A series of tests has been carried out on stanchion lengths of rectangular cross section, bent in double curvature by end

moments of the same sense applied through a system of loaded beams framing into the stanchion on one side. Following the application of the beam loads, the stanchions were subjected to additional axial loading until collapse occurred. Various conditions were studied, including equal and unequal loading between the top and bottom beams. For each case the values of stanchion deflections and rotations have been plotted against the axial load.

For the earlier single curvature tests it was possible, by making certain simplifying assumptions, to derive a satisfactory explanation of the behaviour of the stanchion up to the point of collapse. No such assumptions are given in this report for double curvature bending. Yield occurs first at the ends of a stanchion bent in double curvature, followed by a spreading of the plastic zones towards the centre of the member. This condition, therefore, presents a more complex problem than that of single curvature bending.

Although further work remains to be done, it has been shown that the bending action of the beams has not had that effect on the failing load of the stanchion assumed in the usual design methods. As was anticipated, therefore, the failing loads of the stanchions bent in double curvature were always greater than for corresponding single curvature bending.

NEW U.S. BRAZING METHOD

AN important development in brazing technique, which makes possible the joining of precision, high temperature stainless steel parts is announced by the General Electric Company, U.S.A. The new process is specially successful with difficult stainless steels by brazing them in a hydrogen atmosphere purer than any previously used. When moisture or oxygen is present in a furnace atmosphere without flux, the chromium will oxidise.

The parts to be brazed are sealed in a box, which is then filled with pure hydrogen. As in regular furnace brazing operations, copper is placed adjacent to the joints to be bonded, so that when molten it will creep into the joints. The sealed box is introduced into the heating chamber of an electric furnace for 20 minutes to an hour. It is then allowed to cool. Before removing the box from the cooling chamber, the hydrogen is exhausted and replaced by nitrogen.

The furnace brazing of assemblies by this new technique is sometimes used as an alter-

native to making parts by the more common methods of forging, casting, machining from solid stock, or even other fabricating methods such as torch brazing. Machining time and wastage of metals are said to be often reduced in such instances. Intricate assemblies sometimes can be fabricated which otherwise could not be made any other way and still obtain the quality and results needed. The perfectly clean bright surfaces, after furnace brazing, are particularly advantageous.

Metal Finishing Symposium

A convention and industrial finishing exposition arranged by the American Electropolers' Society is to be held at Atlantic City from June 28 to July 1. Authorities in their respective fields will present a series of technical papers on many aspects of metal surface treatment. The exposition will include displays of equipment for many purposes.

Better Steel Prospects

526 Developments Approved

AN impressive list of major schemes approved by the Ministry of Supply for increasing production of crude steel and foundry iron was announced in the Commons last week by Mr. G. R. Strauss. He had been asked by Col. J. R. Hutchinson whether plans submitted by the British Iron and Steel Federation and the Joint Iron Council had been approved. In reply to further questions, the Minister disclosed that altogether 526 schemes had been examined and passed by the Iron and Steel Board and 69 were under examination.

The detailed list of major developments approved follows:—

Steel Co. of Wales, Margam. Installation of ore unloading plant. Additions to coke ovens. Ore preparation plant and services. Rebuilding of two blast furnaces and new melting shop.

Richard Thomas & Baldwins, Ebbw Vale. New coke oven battery. Additional open hearth steelmaking furnace.

Dorman Long & Co. Ltd., Middlesbrough. Ore unloading, crushing, screening and sintering plant on Teesside. Two new blast furnaces at Cleveland to replace obsolescent units. New steelmaking plant at Lackenby.

Consett Iron Co., Consett. New coke oven battery. Provision of two modern blast furnaces to replace obsolescent units.

Skinningrove Iron Co., Salthurn. Replacement of blast furnace by one modern unit. Reorganisation of steelmaking plant.

Colvilles, Clyde Ironworks. Additional coke ovens. Provision of third blast furnace.

Colvilles, Clydebridge. Replacement of steelmaking furnaces.

Colvilles, Dalzell. Conversion of furnaces to oil firing. Stewart & Lloyds, Clydesdale. Reconstruction of melting shop.

United Steel Companies, Treeton. Replacement of coke oven battery.

John Baker & Bessemer, Rotherham. Installation of new open hearth steelmaking furnace.

Park Gate Iron & Steel Co., Ltd., Rotherham. Modernisation of equipment for charging blast furnaces.

John Summers & Sons, Shotton. Erection of coke ovens and blast furnace. New melting shop.

Round Oak Steelworks, Brierley Hill. New melting shop.

Sheepbridge Coal & Iron Co., Chesterfield. Rebuilding of two blast furnaces. Installation of ore crushing, screening and sintering plant and gas cleaning plant.

Stewarts & Lloyds, Corby. Provision of ore preparation plant. Increase in coke oven capacity. New open hearth melting shop.

United Steel Companies, Scunthorpe. New coke oven battery. Erection of two new blast furnaces to replace obsolescent units. New melting shop.

John Lysaght, Scunthorpe Works, Scunthorpe. New coke oven battery. Provision of ore crushing plant and services. Modernisation of existing blast furnace and erection of modern blast furnace to replace obsolescent unit. Rebuilding and enlargement of steelmaking furnaces.

Richard Thomas & Baldwins, Scunthorpe. New blast furnace to replace two obsolete units. Provision of ore handling plant and pig casting machines. Various other improvements.

B.I.F. Early Closing.—Owing to the Whitsun holiday the British Industries Fair, London and Birmingham, will close at 4 p.m. instead of at 6 p.m. on Friday, May 14.

Laminated Stainless Steel

Glasgow Engineers' New Process

THE adoption of a new process of stainless steel sheet production has recently been announced by Colvilles, Ltd., of Glasgow.

In recent years, to guard against corrosion, it has been the practice to use stainless steel units whenever possible and in many cases where corrosion protection is required on only one surface a waste of material has occurred.

The new stainless-clad steel adopts the practices now common in the timber industry of laminating suitable materials into an integrated bonded whole. The process involves the layering of a stainless veneer sandwich over a normal commercial steel sandwich and, after heating, rolling the two into a permanently welded steel.

The material can be cut, sheared and fabricated as in normal practice and it is claimed that, in some ways, the new stainless-clad is superior. Welding is also stated to be easier than with homogeneous stainless steel, although some change of technique is required in the electric arc process.

Popular Metals Study Course

The first post-war refresher course held by the British Cast Iron Research Association, took place at Ashorne Hill, near Leamington Spa, by courtesy of the British Iron and Steel Federation, from April 14-17. More than 200 representatives of member-firms, together with students of the National Foundry College and members of the association's staff, attended the course, and unfortunately, owing to the number of applications received, it was not possible to accommodate all those who wished to be present. More than 20 lectures were given by the staff and by Mr. J. W. Gardom, Mr. L. W. Bolton and Mr. A. E. Probst. Provision will be made in future to cater for the increasing attendance.

"LION BRAND" METALS AND ALLOYS

MINERALS AND ORES

RUTILE, ILMENITE, ZIRCON,
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**BLACKWELL'S
METALLURGICAL WORKS LTD.**

GARSTON, LIVERPOOL, 19

ESTABLISHED 1869

Promoting Paint Exports

Manufacturers Pool Results

FORMATION of the new public company, Associated Paint Manufacturers, Ltd., with offices at 11a Albemarle Street, W.1, is the result of a scheme conceived by the Paint Manufacturers' and Allied Trades' Association. "The paint industry," says Mr. Scourfield Evans in an interview with *THE CHEMICAL AGE*, "is the first industry to give practical effect to Sir Stafford Cripps' enjoinder to combine for export purposes."

140 Member Firms

Essentially a scheme for the smaller manufacturers, membership is confined to 140 firms—all members of the PMATA. The chairman is Mr. J. A. Parsons (E. Parsons & Sons, Bristol), while the board of directors includes Mr. G. C. P. Ives (Fleetwood Paints, Ltd.). Other directors will be announced later.

"Asopan"

Overseas customers will deal direct with the new company, which will arrange for orders to be fulfilled by manufacturers. There will be one brand name for all types and grades of paint—"Asopan." Those member firms which already have a considerable export business will continue to engage in that business individually as well as participating in the co-operative effort. Meanwhile, manufacturers will continue to market their own brands at home.

Manpower and Expenses

One of the chief merits of the scheme, which has received encouragement from the Board of Trade, is that it avoids the necessity for setting up separate overseas selling organisations, with their large use of manpower and heavy expenses, placing further charges on selling prices. A brochure setting out the aims and services is in course of preparation.

Oil and Colour Chemists

London Section President Re-elected

THE annual general meeting of the London Section of the Oil and Colour Chemists' Association was held at 26 Portland Place, W.1, on Tuesday, April 20, under the presidency of Mr. David E. Roe, who was elected to the chairmanship for a second year.

The seventh series of three post-graduate lectures was entitled "A Review of Recent Advances in X-ray Analysis," and delivered by Sir W. Lawrence Bragg.

During the twelve months ending December, 1947, there was a net increase of 60 in the membership of the section.

Adoption of the report was proposed by Mr. G. Copping, who, having witnessed the birth of the section, said its growth was a creditable reflection on the energy and vitality of those who had conducted it. The report and accounts were adopted.

Officers Appointed

The following were re-elected officers of the section: Mr. H. C. Worsdall (hon. secretary); Mr. L. O. Kekwick (hon. treasurer); Mr. R. F. G. Holness (hon. publications secretary); Mr. A. H. Soans (hon. auditor); Mr. Neil R. Fisk and Mr. P. J. Gay were officially appointed as hon. publicity officer, and chairman of the programmes committee respectively. As the result of a ballot, Mr. E. E. Coker, Mr. J. T. Richmond and Dr. J. J. Sleightholme were elected to the section committee.

B.C.C.'s Royal Patron

The British Colour Council announces that H.R.H. Princess Elizabeth has graciously consented to become patron in succession to the late Earl of Derby. The Council said it was "particularly happy to make this announcement on the date of Her Royal Highness' birthday and to convey our respectful good wishes."

S.C.I. FOOD GROUP NOW NUMBERS 1037

IN the annual report of the Food Group of the Society of Chemical Industry, the hon. secretary states that membership continues to increase steadily, and now totals 1037 compared with 1014 a year ago. Some 350 members also belong to the Microbiological Panel, and 280 belong to the Nutrition Panel. Both panels have recently reported increased activities over the previous year.

Arrangements for the next session include a trip to Eire for a week as the group's summer tour. On November 10 a second

conversazione will be held in the United Dairies Central Laboratories, Wood Lane, W.12. The first annual dinner-dance of the group will be held at Grosvenor House, Park Lane, W.1, on Monday, February 7, 1949, and the London Section will participate.

Four nominations have been received for the three vacancies on the Ford Group Committee. They are Dr. F. H. Banfield, Dr. I. B. M. Coppock, Mr. F. C. Hymas and Mr. E. M. Learnmonth.

American Chemical Notebook

From Our New York Correspondent

THE fifth meeting of the International Rubber Study Group opened in Washington on Monday. Delegates from 15 nations will discuss problems connected with synthetic, natural, and reclaimed rubber. Meetings of the group, which will probably last a week, will be held in closed sessions, with a Press conference.

The countries represented at the meeting are Australia, Belgium, British Colonies, Burma, Canada, Ceylon, Czechoslovakia, Denmark, France, Hungary, Italy, Liberia, Netherlands, the United Kingdom, and the United States. Observers were also present from the Food and Agriculture Organisation, the Pan-American Union, the International Bank and the United Nations.

* * *

The installation of a new rolling mill has been started by the American Cladmetals Company at Carnegie, Pennsylvania. The company's rolling mill has already been delivered. The American Cladmetals plant at Carnegie, Pennsylvania, is the first in the United States designed for the exclusive production of cladmetals and the company holds full rights to the Kinney process by which dissimilar metals, such as copper and stainless steel, are permanently bonded together without soldering, electroplating or the use of adhesives.

* * *

An annexe to Yale University's Sterling Chemistry Laboratory, containing a small chemical laboratory, a compressor room, and a main laboratory room with seven steel-walled "cells" for high pressure experiments, has just been completed to meet the growing needs of the University's Department of Chemical Engineering. The building will be devoted entirely to graduate research in chemical engineering, particularly in the fields of catalytic gas reactions of physical properties at high pressures, according to Prof. Barnett F. Dodge, chairman of the chemical engineering department. The steel-walled "cells" are constructed to permit the safe handling of highly compressed gases, some of which will be under pressures of up to 100,000 lb. p.s.i. Other experiments at the new annexe will concern the oxidation of hydrocarbons and reactions involving carbon monoxide. Reactions of both types are expected to yield oxygenated carbon compounds, many of which are important to industry, particularly in the field of plastics. Dr. Shen-Wu Wan, research assistant in chemical engineering, has been appointed to supervise

the U.S. Navy-sponsored work and will serve as superintendent of the new annexe.

* * *

The (U.S.) General Electric Chemical Department has announced that it will start immediately to market a complete line of phenolic moulding powders, including general purpose, high heat resistant, and impact resistant plastic materials. All are subjected to severe tests of specific gravity, tensile strength, dielectric strength, flow, powder pourability, shrinkage, and Izod impact. Officials said that the moulding materials provide excellent finishes and high glosses and will be available in a flow range of soft, medium-soft, medium-hard, and hard.

* * *

Details of the use of "wet water" for extinguishing fires were given at the recent annual meeting of the U.S. Society of Mechanical Engineers, Atlantic City, New Jersey. The liquid is described as a concentration of organic chemicals possessing so fast a penetrating action that, when added to water in small amounts, it increases the extinguishing capacity of the water by as much as 200 to 400 per cent. The new penetrant has been developed by the Carbide & Carbon Chemicals Corporation, New York, and is known as "Unox."

* * *

Mr. Richard Erle, president, has announced the formation of Pavinoletum, Inc., with offices at 342 Madison Avenue, New York City, as a subsidiary for the exploitation in the Western Hemisphere of the products of Harvey Langford, Ltd., London, special paint manufacturers. Mr. Erle said that the new organisation will manufacture one-coat covers for concrete and similar specialities.

* * *

Stanolind Oil & Gas Co., Tulsa, Oklahoma, plans to construct an \$80 million synthol plant for the conversion of natural gas to liquid fuels and chemicals. A site has been chosen at Dodge City, Kan.

* * *

Steel companies in the United States possess 944 open-hearth furnaces, 29 bessemer converters and 217 electric furnaces, according to the latest statistics compiled by the American Iron and Steel Institute. These furnaces have a combined annual capacity of 94,233,460 tons of ingots and steel for castings, which represents the highest peacetime total.

ATOMIC RESEARCH IN THE U.S.S.R.

More than £1000 Million Allocated

BECAUSE of the unrelieved secrecy which shrouds Russia's part in atomic research, interest attaches to the summary of information coming from Spanish sources, including in particular Rafael Miralles, author of "Espanoles en Rusia." Perhaps the most significant is the statement that as long ago as 1944, 51,404 million roubles (more than £1000 million) had been allocated for atomic research in the U.S.S.R.

Under the direction of Prof. V. L. Komarov, president of the Academy of Sciences in Moscow, a strong committee of technicians and scientists has been appointed. Work done so far is reported to have included extensive exploration of mineral resources in Siberia, the Urals, and the Kazakh Republic (Kazakhskaya U.S.S.R.) where it is understood that large deposits of uranium are to be, or have been found.

Although all details of the work, even the most apparently insignificant, are so far as possible cloaked in secrecy, there is reason to believe that atomic research has for many years been undertaken in Russia; especially in view of the keen interest her scientists have taken in all branches of physics, and the vigour with which they have endeavoured to keep in the forefront. Results achieved probably have not reached the level of that in other countries, but they are probably much more advanced than is commonly supposed.

39 Establishments

In 1943 a special Ministry, shrouded in some secrecy, was set up to study new weapons and methods in modern warfare, including the atomic bomb. It was called the People's Commissariat for Projectile Armament (Armamento Mortero), with Peter I. Parshin as Chief Commissar, and Vassili P. Andreyev as Vice-Commissar. The new organisation rapidly expanded, and at the beginning of 1945 it had under its control 39 factories and research centres. During the same year the Chief Commissar was invested with the "Order of Lenin" and honoured with the further title of "Hero of Soviet Work" and high military rank.

Atomic research was in the hands of a separate department with B. N. Byezrukov as its head, and an enormous research centre was established in Arctic Russia, in a closely guarded enclosure at Ukhta, contiguous to deposits of radio-active minerals such as uranium and radium. The director of this establishment was N. A. Volkov, and

work commenced in 1944. He too was promoted to high military rank in view of his "extremely valuable services." His staff included the most eminent Russian physicists, such as Profs. Kapitza, Semenchenko, Tamm, Alikhanov, and others.

The Spanish writer says that progress for a time was unsatisfactory owing to the proverbial incapacity of the Red bureaucrats and the niggardly financial allocations—notwithstanding the huge sum mentioned above—which were bitterly criticised by Kapitza himself. After the war, however, Stalin is said to have taken a personal interest in atomic research, and some drastic changes were made, both in staff and in financial support. Byezrukov appears to have been dismissed and the name of the Projectile Commissariat was changed to Ministry of Construction of Machinery and Instruments, and divided into two sections.

Providing Supplies

Some equipment was obtained from abroad, *e.g.*, from Sweden and Switzerland, and an intelligence department organised to get information from other countries. Arrangements were made for imports of uranium ore from Czechoslovakia, and two huge factories for instrument construction, including many of special type, were erected in Yoskar Ola and Uralmashzavod, near Sverdlovsk in the Urals.

The supply of essential chemicals required in atomic research is the responsibility of the Ministry of Chemical Industry, whose chief is M. G. Pervukhin, aided by leading scientists including Prof. Vacilov, who is now president of the Academy. Kapitza, however, remains the real head of the elaborate series of research stations and factories which have now been established for atomic and related research. In August, 1946, Molotov (Commissar of Public Relations) expressed the view that within two years Russia would have surpassed Anglo-American achievements. Whatever truth there may be in that, it is noteworthy that the new Five-Year Plan, beginning in 1946, has provided that new centres of key industries are to be well dispersed, mostly towards the east, and remote from dense centres of population.

U.S. Technical Books.—Substantial reductions in book prices, including their general chemistry list, ranging from 25-50 per cent are announced by the Reinhold Publishing Corporation, 330 West 42nd Street, New York, 18.

German Chemical and Metal Prospects

Large Supplies of Marshall Aid Materials Expected

REPORTS from the principal industrial areas of the three western occupation zones of Germany indicate a slow recovery in the chemical and allied industries, although expansion of production is still delayed by shortage of essential materials, and because of difficulties experienced in the repair of damaged plant. In recent months there has been an improvement in the fuel position, and no shortage of skilled labour is anticipated even if the tempo of reconstruction increases.

After Allied revision of the German suggestions for imports under the European Recovery Programme, it is now expected that during the first year of aid the western zones of Germany will receive chemical raw materials and manufactures to the value of \$110.24 million. This figure does not include chemical fertilisers (on which \$69.29 million are to be spent) or smaller amounts of non-ferrous ores, cellulose and various other commodities.

Objections to Dismantling

Meanwhile German industrialists are urging a revision of the dismantling plans. Attention has been drawn to the fact that while chemical plant capacity in the combined Anglo-U.S. zone is still only 2 per cent below the 1936 level, in the French zone no more than 65 per cent of the 1936 capacity remains. It is argued that at such an important centre as Ludwigshafen "up to 90 per cent" of the production and research facilities of the heavy chemical industry has been destroyed with the result that the remaining plant is urgently needed for peacetime purposes.

Of chemical firms in this locality, Gebr. Giulini GmbH is now concentrating on the production of pharmaceutical preparations, washing agents and baking powder, and engaging in repair work on railway waggons. Chemische Fabriken Knoll AG is employing some 800 workers on pharmaceuticals. Chemische Fabrik Dr. F. Raschig GmbH has been forced to reduce production owing to shortage of plastic raw materials. Chemische Fabrik Joh. A. Benckiser has discontinued the manufacture of tartaric acid and is now producing only citric acid and phosphates.

Essener Steinkohlenbergwerke has been granted a licence for the re-opening of its chemical works. These include the largest Fischer-Tropsch plant in the Ruhr which is expected to make a substantial contribution to overcoming the shortage of fatty acids,

so that the gap between official rations and actual allocations can at least be reduced. The present shortage of calcined soda prevents an expansion of the production of washing agents and detergents, but it is anticipated that repairs to existing soda works will have made sufficient progress by the end of 1948 to permit doubling the allocation of washing powders.

Farbenfabriken Bayer has drawn up plans for the erection of a film factory to improve the supply of film for X-ray purposes. The cost of the project is estimated at RM 1 million.

Over 5000 applications were received by the authorities responsible for the allocation of surplus machinery from I. G. Farbenindustrie factories in Ludwigshafen, while the number of individual items to be allocated is 217. Even applications recognised as urgent are far in excess of the available plant installations.

Coal allocations for the chemical industry (including fertiliser factories) in the combined Anglo-U.S. zone have been fixed at 806,000 tons for the second quarter of 1948, a slight increase on deliveries in March. It is also intended to provide more mineral oils from Venezuela and Arabia for processing in German refineries.

Ore for W. Germany

Luxembourg and Swedish Supplies

THE recent decision of the British and U.S. authorities to permit a resumption of the important pre-war iron-ore trade between Sweden and Germany—1.4 million metric tons of Swedish ore are to be supplied this year—has been followed by an agreement between the Joint Export-Import Agency and the Luxembourg Coal and Iron Sales Bureau ("SOGECO"). This agreement envisages the supply of about 400,000 metric tons of Luxembourg iron-ore to the Ruhr region. The monthly rate will at first run at about 25,000 metric tons, to be increased as soon as possible to about 40,000 tons. Similarly as in the agreement with the Swedes, payment is to be made in dollars and it is reported that a price of 3 U.S. dollars per ton of Luxembourg iron-ore with an Fe-content of 25 per cent has been agreed upon. For each additional per cent of iron content, 15 U.S. cents are to be added. The Fe-content is usually about 30 per cent.

THE MONOPOLY BILL

President of the B.o.T. States His Case

MOVING in the Commons that the Monopoly (Inquiry and Control) Bill be read a second time, Mr. H. Wilson, President of the Board of Trade, in the course of his opening speech said: "It is certain that in the world as we know it now, as it will be in the next 10 or 20 years, we cannot as a nation afford restrictive practices if they increase our costs abroad, if they prevent the fullest development of inventions and new techniques, or reduce output, or maintain prices at an excessive level to our consumers at home; or afford practices which deny to the new and more efficient producer a means of entering an industry, or to the inventive or progressive producers a chance of expanding.

"The case for this Bill rests on three main facts: first, the great growth of monopolies and restrictive practices during the present century in this country; secondly, the undoubted powers that these monopolies or restrictive arrangements have to inflict damage on the economy of a country or to inflict injustice on some of His Majesty's subjects; thirdly, the clear necessity of finding out all the facts to see whether this power to do harm is, in fact, being used in an anti-social way and, where it is, of taking effective and appropriate steps to curb any of these anti-social practices.

"It is common ground that during the past half-century monopoly or monopolistic conditions have taken hold of an important section of British industry. Even where firms have remained nominally independent there are price fixing arrangements, quota arrangements, boycotts, loyalty rebates, centralised selling, price leadership, retail price maintenance, and black lists cutting off supplies to individual dealers."

"Power for Harm"

"A monopoly which involves full integration of the financial and economic structure of an industry—as for instance, Imperial Chemical Industries—may well have great technical advantages within itself which a cartel or a price-fixing association has not, especially in relation to redundant plant and research and the advantages of large-scale operation; but, at the same time, its strong selling power gives it undoubted power to do harm to the public generally and to particular consumers.

"There is one class of monopoly which I must mention. That is the monopoly which springs from the granting of patents. The monopoly which the patent gives can be used, and no doubt is generally used,

in the public interest; but there may well be cases where licences are granted under patents containing restrictive conditions which are not in the public interest. Certainly, the Monopoly Commission in its inquiries must not stop short of patents and licences which have been granted under them, and it will give in its findings no doubt express views on restrictive conditions in licences. Any action regarding patents must, I think, be taken under the Patent Acts."

The President went on to refer to the close integration of the cement and electric lamp industries.

Monopoly Commission

"The main purpose of this Bill," he said, "is the establishment of the Monopoly Commission. In any case where the conditions described in Clauses 3 to 5 of the Bill are found to operate, the Board of Trade have power to refer them to the Commission for investigation and report. The Commission are not given any power for initiating inquiries, and nor has any member of the public the right of direct access to the Commission with any complaint or grievance which he wants investigated.

"The responsibility of deciding whether a case, large or small, should go to the Commission rests with the Board of Trade. One of the main reasons for that is that we are anxious to protect the Commission from having to waste time of dealing with cranks and cases of relatively small importance."

NATIONALISATION SOUGHT

At a meeting of the Chemical Workers' Union, held at Derby on Saturday last, a call was made for nationalisation of the British chemical industry. The Government was also urged to inquire into and report on the I.G. Farbenindustrie (German Dye Trust) with a view to its nationalisation.

Acting general secretary Mr. Bob Edwards said the union welcomed the Monopoly Bill.

The Political Correspondent of *The Financial Times* commented on Wednesday: "Engineering and chemical industries are believed to be heading the list of the industries which the leaders of the Labour Party intend to nationalise after the General Election. Even before this is achieved, the demand for joint production boards in which employees have a say may possibly be backed up by the Government. Between now and 1950 no further nationalisations are expected, apart from iron and steel.

Parliamentary Topics

Tin and Copper Contract Prices.—Asked to define Ministerial policy with regard to contract prices for copper and other non-ferrous commodities, in view of the fact that he had announced contract prices for tin, Mr. G. R. Strauss said tin was bought at a price fixed after discussion with producers' representatives. They received a basic price, which could, therefore, be made public. Copper, lead, zinc and chrome were all bought under varying arrangements from many companies all over the world, and the prices paid were the result of normal commercial bargaining. Aluminium was obtained under contract from producers in this country and Canada. Those prices had, therefore, to be treated as confidential in the interests of the producers and the Ministry.

Steel Board's Duties.—The Steel Board's responsibilities are broadly to consider plans for the development and modernisation of the iron and steel industry, including foundries; to exercise general supervision over production; to administer the current controls over production, distribution and imports; and to advise on general price policy and on the fixing of prices for controlled products.—Mr. G. R. Strauss.

Chemical Linters.—In reply to a question in which it was alleged that the necessity of buying chemical linters through the Board of Trade forced firms to pay 1d. to 2d. per lb. more than they would pay if they had been free to purchase direct, Mr. H. Wilson said: The world shortage of chemical linters in 1946 and 1947 made it necessary to buy supplies at high prices in order to safeguard the requirements of the rayon and other industries. Stocks were built up for this purpose, and until they have been liquidated the selling price must be somewhat above the price abroad. It was, however, reduced on April 1 by seven-eighths of a penny.

Soda Ash Shortage.—A further small quantity of soda ash has been made available to the Alloa Glass Work Co., Ltd., following publicity given to the fact that the firm would be obliged to suspend activities if no assistance were given. This decision will mitigate the full effect of the impending close-down and dismissal of labour, but will not completely prevent it. The extreme shortage of soda-ash was admitted by Mr. J. W. Belcher in a statement in the House of Commons last week (THE CHEMICAL AGE, April 24).

Official Notices

Oils and Fats.—The Minister of Food announces that no change will be made in the prices of refined oils and imported edible animal fats allocated to primary wholesalers and large trade users during the eight-week period ending June 19.

Control Orders Revoked.—The Minister of Food has decided that it is no longer necessary to continue to control the prices of citric and tartaric acids. He has, therefore, revoked the Citric Acid (Control and Maximum Prices) Order, 1942, and the Tartaric Acid and Cream of Tartar (Control and Maximum Prices) (No. 2) Order, 1944, as from April 21.

Pyrethrum Flowers: Private Imports.—The Board of Trade announce that licences for the import of pyrethrum flowers will now be granted. For the time being importers will be required to purchase one ton from Government stocks in the U.K. for each ton imported. The price of pyrethrum flowers bought from Government stocks in this country is now reduced to £145 per ton ex store, based on a pyrethrin content of 1.3 per cent with an allowance of 5 per cent off the selling price for each .05 per cent pyrethrin content below 1.3 per cent and an addition of 5 per cent to the selling price for each .05 per cent above 1.3 per cent. A discount of 3 per cent will be allowed for lots of five or more tons.

CEMENT PRICES

WHEREAS the average price of building materials in this country has increased by about 104.5 per cent since 1939, Mr. Halford W. L. Reddish told the annual general meeting of the Rugby Portland Cement Co., Ltd., last week, cement price has increased by only 60.8 per cent.

With regard to the supply of coal to the cement industry, Mr. Reddish said that so far this year the position was satisfactory from the standpoint of quantity, if not in quality and price, and the company was now producing to capacity for the first time since 1939.

Dunlop Appointments

MR. DONALD HAWKINS, general sales manager, Dunlop Sports Company, has been appointed production director of Dunlop Malayan Estates, Ltd. He was with Dunlop in Malaya until the Japanese invasion, and then joined the tyre division in England.

MR. JESSE HOLLOWES, head of the winding department at Dunlop's cotton mills in Rochdale, has been appointed production manager of their new Dunfermline factory.

MR. R. C. WOODWARD is leaving for Singapore to become sales assistant with the Dunlop Rubber Co. (Malaya), Ltd.

Home News Items

Salvage.—The paper bags in which carbon black for tyre-making arrive at Fort Dunlop are now being salvaged and pulped into coloured paper.

British Association Meeting.—The British Association has published the preliminary programme of the 110th Annual Meeting which will be held in Brighton from September 8 to 15, with Sir Henry Tizard as president.

Photo-Electric Absorptiometer.—In the description of the photo-electric absorptiometer developed by R. S. Alldridge, Ltd., the standard deviation in a number of tests was wrongly stated to have been approximately 0.4 per cent. The correct figure is 0.04 per cent.

Fifty Long Service Awards.—Presenting inscribed gold watches to four men employed for 60 years in the Waverley Iron Works, Coatbridge, Mr. A. K. McCosh, chairman of Bairds and Scottish Steel, Ltd., said that more than 50 gold watches had now been presented to employees with equivalent service.

Aluminium Decision Awaited.—The British Aluminium Co., Ltd., is anxiously awaiting a Government decision on their £1 million extensions planned at their Falkirk Mills. Other plants affected by the Government cut in capital investment programme are a new £12 million oil refinery at Grangemouth for the Anglo-Iranian Oil Co., and expansion of the I.C.I., Ltd., dyestuffs factory in the same district.

Bakelite Factory Closes.—Production at the Ruabon (Catham) works, of Bakelite, Ltd., ceased yesterday. The company employed about 100 local people manufacturing moulding materials for the past seven years. The factory was taken over in 1941 as a wartime measure to disperse production units from Birmingham. The closure follows the reconcentration at the major works and the opening of a new factory at Durham.

Mullard Title Change.—The Mullard Wireless Service Co., Ltd., which started life in 1920 as the Mullard Radio Valve Co., Ltd., and quickly made its name in the manufacture and development of thermionic valves for radio transmitting and receiving purposes, will in future be known as Mullard Electronic Products, Ltd. The change has been made necessary by the expansion of the company's activities from that of the purely "wireless" field into other branches of electronics—particularly those with applications in industry, science and communications.

To Produce Formaldehyde.—Contractors have begun work clearing the disused Alyn Tinplate Works at Mold where a new light industry is to be established for the production of formaldehyde.

New Plant for Gasworks.—The installation of new plant at the Southport gasworks is expected to save £25,000 a year. Tenders amounting to £135,000 have been accepted for a carburetted water-gas plant, mechanical producers and coke handling plant.

Better Yield of Opencast Coal.—Output of saleable coal last week improved to 4,269,000 tons (4,224,100), aided by the record production from opencast workings of 352,000 tons (318,000), and would have been substantially higher but for the unofficial strike in the South Yorkshire fields.

3.2 Million Tons Iron Castings.—A record production of 3.2 million tons of iron castings by the end of 1948, provided the present production rate is maintained, was forecast at Birmingham last week by Mr. D. Howard Wood, Midland Iron Founders Association. The figure would exceed last year's production by more than 350,000 tons.

Scottish Pottery Industry.—With the object of developing a pottery industry in the Scottish Highlands, a training school has been established at Morar under the auspices of Highland Home Industries, Ltd. Clay found near Loch Morar has been tested and found equal to the Staffordshire variety and deposits are also being investigated in Kintyre.

Former I.C.I. Works.—Valley Ordnance Factory at Rhydymwyn, near Mold, is considered unsuitable for a new industry, and from July 1 it will be used as a storage depot by the Ministry of Supply. During the war the factory was operated for the Ministry of Supply by I.C.I. and during peak production employed about 2500. Since the war only a skeleton staff have been employed.

Larger Engineering & Marine Exhibition.—The organisers of the 1947 Engineering & Marine Exhibition, Messrs. F. W. Bridges & Sons, Ltd., announce that they have secured the whole of Olympia for their next exhibition, which will be held from August 25 to September 10, 1949. A large number of would-be exhibitors were excluded from the 1947 exhibition owing to the lack of space in spite of the use on that occasion of the National Hall and its galleries in addition to the main hall and its annexe.

Monsanto Chemicals

Informative Report and Accounts

AFFORDING something new in the way of annual reports and accounts, Monsanto Chemicals, Ltd., has produced a booklet which, in addition to containing the chairman's statement and a summary of the customary accounts, provides information of a more general and statistical nature concerning the company's production, research and sales activities. This is achieved by the inclusion of an article, "Serving Industry Which Serves Mankind," with the objective of enlightening the 3000 or so new stockholders created by the company's re-capitalisation last year.

Of interest is a graphical representation of Monsanto's sales during the years 1931-47, with significant discrimination between home and export totals. Despite understandable reticence about exact figures, total sales (1938 = 100 per cent) are shown to have risen steadily to nearly 200 in 1947. They jumped to nearly 275 in 1946 and 287 in 1947. Exports in 1938 are given as just over 25. This had jumped to 87 by 1946, but fell to a little more than 75 in 1947, when home sales were represented by about 212. In a similar way, the booklet presents a graphical picture of the company's capital investment position at the end of each year for the period 1934-46, and the disposal of income during 1947.

Research Activities

Research and development projects in that year received £100,000. The Ruabon research building, it is stated, will be completed this year. In all branches of its work, the company emphasises, the Research Division aids and is aided by its U.S. counterpart. Although each, to a great extent follows its own plan of research, all resulting information is mutually shared, and the fruits of U.S. technological skill in the production of a new chemical in the U.S.A. become equally the property of the British company.

Education of Employees

Importance — says the statement — is attached to the further education and training of juvenile employees. Factory training schemes operate for apprentices, laboratory assistants and junior clerical staff. Such schemes also incorporate provision for attendance at local technical colleges for one day in each week.

A job-grading scheme, recently introduced on a trial basis, is now in operation at Ruabon. It is hoped that this, eliminating "dead-end" occupations, will encourage young people to avail themselves of the training facilities.

Technical Publications

THE incidence of dermatitis among chemical workers, its prevention and treatment, form a subject which demands the closest attention of management, industrial medical supervisors, and workers. Considerable sums of money have been spent on research into skin infections, and there are suitable precautions, the result of scientific inquiry and development, which confer a reasonable degree of immunity. Most familiar of the safety measures now widely advocated is the pre-application of protective substances, "barrier creams." Up-to-date information on the dermatitis problem, the nature and functions of the skin, and its protection in the chemical industry, is now provided in "Skin Protection in Industry," a well-prepared, illustrated, 32-page booklet produced by Rozalex, Ltd., 10 Norfolk Street, Manchester. It is distinguished by a number of excellent photographs illustrating characteristic types of common industrial skin infections.

* * *

An illustrated pamphlet published by the Institute for Scientific and Technical Measuring, Vienna, describes a new mud recorder, a measuring and recording device for the continuous and automatic control in drilling for mineral oil and natural gas, an invention of Eng. F. C. Windprechtner. The apparatus, which is already in satisfactory use at the Soviet-controlled oilfields of Zistersdorf, consists of two parts: a measuring unit, placed at the derrick, and a recording unit at the office of the drilling supervisor for the control of seven components, namely: specific gravity, temperature, gas, gel rate, pH degree, viscosity and sand content.

* * *

A publication on the grand scale, which in these days of severe paper economy is a rarity, has been produced by Thos. W. Ward, Ltd., for its subsidiary company, Widnes Foundry & Engineering Co., Ltd., largely for the information of the chemical industry. Profusely illustrated and excellently presented and described is the story of the company's development over the 100 years of its existence. An ambitious publication, it contains much that will interest the chemical engineer.

* * *

The U.S. Metal Powder Association has published a standard for the determination of the flow rate of metal powders prepared by the association's Granular Powders Standards Committee and 50 companies active in the metal powder industry. Copies are available from the association's offices at 420 Lexington Avenue, New York 17.

PERSONAL

MR. A. L. BACHARACH has recently retired by rotation from a vice-presidency of the Royal Institute of Chemistry after holding the appointment for three years. On the invitation of the Committee of the Privy Council for Scientific and Industrial Research, he has become a member of the Chemistry Research Board. Mr. Bacharach, who is head of the nutrition unit in the research division of Glaxo Laboratories, Ltd., Greenford, has also been invited to serve on the congress committee of the First International Biochemical Congress which may be held at Cambridge in August, 1949, under the auspices of the Biochemical Society.

MR. C. G. FRY, secretary of Lewis Berger group of companies since 1941, has been appointed to the board. Mr. Fry, who is 42, played a prominent part in bringing about the recent merger between Lewis Berger's South African subsidiary company and I.C.I.'s South African subsidiary company, African Explosives and Chemical Industries.

MR. CLAUDE DIAMOND has left the service of Courtaulds, Ltd., after 28 years' service, latterly as chief technical manager (Acetate Division) and will in future practise as an independent consultant at 54 Northumberland Road, Leamington Spa.

MR. VERNON H. WILLIAMS, for the past two years manager of Cookes Explosives Factory, Penhrynudraeth, was slightly injured in the recent train disaster at Winsford.



Col. H. C. Smith, former managing director of the Tottenham and District Gas Company, whose appointment as deputy chairman of the Gas Council is also announced

MR. L. W. RICHARDS, of Bamag, Ltd., has started on a business visit to India and Pakistan; MR. H. W. ABEL (exports manager) has arrived in Buenos Aires from Rio de Janeiro in response to the increased demand for chemical, and oils and fat plant in South America.

MR. H. E. F. PRATLY, general manager of Shell Refineries, Ellesmere Port, has been appointed to manage the firm's installations at Heysham, Morecambe. He is succeeded by MR. F. MACKLAY, of Shellhaven, formerly assistant manager at Ellesmere Port.

MAJOR C. R. DIBBEN, who since 1919 has been Midland Secretary of the FBI, is retiring from that office to devote more time to other industrial interests. His place as FBI Midland Regional Secretary will be taken on September 1 by MR. ION EARLE, who joined the FBI in 1938 as assistant to Major Dibben in the federation's Birmingham office.

Obituary

SIR WILLIAM REAVELL, founder and managing director of Reavell & Co., Ltd., engineers, died at his home at Ipswich on Sunday last, aged 83. He was the brother of MR. A. J. REAVELL, of Kestner Evaporator & Engineering Co., Ltd., manufacturers of the Reavell infra-red drying apparatus.

MR. G. J. CLIFF, president of Toronto Salt Works, died at Toronto last week at the age of 82.



Mr. A. E. Sylvester, newly appointed chairman of the Gas Council and former governor of the Gas Light & Coke Company

Overseas News Items

U.S. Aluminium Plant in Chile.—Reports from Chile state that U.S. businessmen are negotiating with a local company for the installation of an aluminium plant, to be financed largely by American capital.

Argentina's 1947 Cement Output.—According to official statistics the production of cement in Argentina last year amounted to 1,363,357 metric tons, an increase of 18 per cent on the 1946 total.

Awards for Welding Research.—A first prize of \$750 and other prizes ranging from \$200 to \$500 are to be awarded by the U.S. Resistance Welder Manufacturers' Association, Philadelphia, for the best papers dealing with resistance welding subjects submitted to the American Welding Society before July 31, 1948.

Whisky from Wood.—The U.S. is wasting 10 million tons of sawdust each year, asserts Dr. Robert S. Arics, prominent American scientist. If used as a source for the alcohol in whisky the sawdust could supply more than three times the world's whisky requirements as one ton of sawdust produces 50 gallons of drinkable alcohol.

Mechanised Mining Project.—The U.S. bituminous coal industry has launched a \$250,000 engineering programme to design a machine that will mine coal cheaper and faster. The objective is a machine that will both cut coal "off the solid" without the use of explosives and load the coal continuously into a conveyor or into mine cars.

Rare Metals in Australia.—Plans for the formation of a new company for the mining and processing of rare metals in Western Australia have been announced in Perth by Tantalite, Ltd. It is proposed that the company should have a capital of £A200,000. The metals to be treated will include tantalum which sells at £36,000 a ton. A special processing plant is to be set up at Welshpool, just out of Perth. It will also produce beryllium and caesium metals and would undertake various research projects.

British Cement Plant for Iraq.—A Sheffield engineering firm, Edgar Allen & Co., Ltd., is supplying the machinery to build a complete cement plant for the Iraq Cement Company, on the banks of the Tigris, a few miles from Baghdad. The plant will make use of local limestone and clay as raw materials and will be capable of producing approximately 87,000 tons of cement a year. Production will be by the wet process, and the kiln will be fired by fuel oil. Most of the plant has already been despatched from Britain.

Canadian Alcohol Plant.—In a letter to shareholders, Commercial Alcohols, Ltd., states that it expects to have its new alcohol plant at Gatineau, Quebec, ready for production before the end of 1948.

"More Uranium" Hint.—Mr. J. W. Musset, South African Minister for Economic Development, declared at Cape Town, on April 21: "We believe we have more uranium in this country than in any other country in the world."

Atomic Weapon Tested.—The U.S. Atomic Energy Commission has announced that there has been a test of an atomic weapon at the Commission's proving grounds on Eniwetok atoll in the mid-Pacific Marshall Islands. The nature of the test or date when it took place was not announced.

Italian Cement Sales.—Sales of Portland cement in Italy are making little headway. Although the price has been reduced from 10,000 lire per ton to 7850 lire, and some firms are giving extra discounts, this has not helped. The situation is reported as unlikely to improve until full revival of building industry takes place.

L. Berger Australia Expansion.—Upon his arrival at Sydney, Australia, last week, Mr. Wm. Darby, managing director of Lewis Berger & Sons, said that his company planned to spend £350,000 on plant and buildings in Australia this year. In addition to modernising the existing factory at Sydney, others are being built at Adelaide and Brisbane.

U.S. Boom in Synthetic Detergents.—People living in hard-water districts of the United States will probably use more synthetic detergents this year than ever before, says the *New York Journal of Commerce*, and as hard water is the predominant type used in the U.S.A., the synthetic detergent industry is making a tremendous sales effort to attract consumers in these areas. New uses for these detergents are dyeing, washing jobs where only cold surfaces are cleaned, and as antiseptic materials.

Assuan Dam.—An engineering project of the utmost importance to Egypt and the Middle East, was started when the King of Egypt recently laid the foundation stone for the Assuan Dam which has been planned to produce 500,000 KW of electric power per year. The cost of this project—which may be completed by 1951—is estimated at £11 million. Among industrial projects to benefit from the new dam is the proposed nitrogenous fertilisers industry, and the smelting of iron-ores occurring near Assuan.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

MONO-PLASTIC CHEMICALS, LTD., London, S.W. (M., 1/5/48.) March 24, by order on terms, series of £20,000 debts., present issue £5000; general charge.

W. A. MITCHELL & SMITH LTD., Mitcham, chemical manufacturers (M., 24/4/48.) March 17, £4000 (not ex.) mortgage to Lloyds Bank Ltd.; charged on factory and land at Church Path, Church Road, Mitcham. *£3739. January 12, 1948.

IRISH PHARMACEUTICALS, LTD., Dublin. (M., 1/5/48.) April 5, mort. securing present and future advances with interest thereon made or to be made by the Hibernian Bank, Ltd.; charged on (1) 1 Mount Brown, James' Street, Dublin, held under lease dated April 25, 1945 (2) other premises at Mount Brown, with dwelling-houses, etc., thereon held together with other premises under fee farm grant dated May 30, 1866 (3) 1a Brandon Terrace, Basin Lane, Dublin, held with other premises under lease January 24, 1878. *Nil. December 1, 1947.

Company News

The Rio Tinto Co. has declared a dividend on its ordinary shares of 8 per cent—the first ordinary distribution for 17 years.

United Molasses Co. has declared a final dividend of 17½ per cent (total 32 per cent) and a tax-free distribution of 2½ per cent on its profit of £710,631 (589,159).

The nominal capital of **Swift Chemical Co., Ltd.**, 20-21 Lawrence Lane, London, E.C.2, has been increased beyond the registered capital of £5000, by £3000, in £1 ordinary shares.

The nominal capital of **Bowmans Chemicals, Ltd.**, Moss Bank Works, Widnes, has been increased beyond the registered capital of £60,000, by £90,000, in 75,000 ordinary shares of 4s. and 75,000 5½ per cent redeemable cumulative preference shares of £1. The company has been converted into a "public" company.

The nominal capital of **Dae Health Laboratories, Ltd.**, 25-7 Berners Street, London, W.1, has been increased beyond the registered capital of £1000 by £500, in £1 ordinary shares.

New Companies Registered

Pioneer Drug & Chemical Co., Ltd.—Private company. Capital £500. Directors: A. Rudnick, and Mrs. Hester Rudnick. Reg. office: 13 Whitechapel, Liverpool, 1.

Parker, Lawrence & Co., Ltd. (452,905).—Private company. Capital £500. Manufacturers of chemicals, gases, medicines, drugs, etc. Directors to be appointed. Reg. office: 62-4 Brook Street, W.1.

R. Saro Manufacturing & Trading Co., Ltd. (452,745).—Private company. Capital £500. Manufacturers of chemical products, drugs, fats and oils, etc. Sec.: E. M. Hawtin. Reg. office: 203 Regent Street, W.1.

Sheaf Pharmaceuticals, Ltd. (452,607).—Private company. Capital £100. Manufacturers of chemicals, drugs, medicines, etc. Directors: R. V. Moore and Beatrice M. Moore. Reg. office: 40 South Street, Sheffield, 2.

F. J. Hone and Partners, Ltd. (451,702).—Private company. Capital: £2500. Designers and manufacturers of engineering appliances of all kinds, particularly plant for the chemical industry, petroleum refining, coal tar refining and the engineering trades, etc. Directors: F. J. Hone and F. L. Walker. Reg. office: Research Laboratories, Godstone Road, Whyteleafe.

Chemical and Allied Stocks and Shares

SENTIMENT has been affected to some extent by last week's big fall in National Savings and a tendency earlier in the week to await Parliamentary discussion of the Finance Bill. Stock markets have accordingly been less active and prices lower in most sections. British Funds failed to keep last week's rally, buyers holding off pending clarification of the investment income levy. The Palestine news made for caution.

Chemical and kindred shares have been quite well maintained with Imperial Chemical more active at around 48s. 9d. at which there is a yield of over 4 per cent, which is not unattractive bearing in mind the big margin of earnings shown over the recently-declared 10 per cent dividend. Monsanto Chemical 5s. shares strengthened to 59s. 4½d. and yield rather less than 3½ per cent on the basis of last year's 45 per cent payment. British Aluminium have been

firm at 50s., and British Oxygen at 99s. 4½d. kept firm following publication of the report and accounts. Lever & Unilever were 52s. 1½d. and yield little more than 3½ per cent., but the market is confident that when dividend limitation is removed, shareholders may very well receive payments well above last year's 10 per cent. United Molasses were 49s. on the record profits, and the units of the Distillers Co. were 27s. 1½d. B. Laporte 5s. ordinary have changed hands around 21s. 6d., Fisons were 61s. 9d., with Greiff-Chemicals (Holdings) 5s. shares at 16s., while Albright & Wilson 5s. ordinary changed hands around 30s. 4½d.

Amalgamated Metal shares have strengthened to 22s. awaiting next Monday's speech from the Minister of Supply on the request for re-opening of the London Metal Market. In other directions, General Refractories 10s. shares were 23s. 9d. the yield of 4½ per cent attracting buyers on the view that there seem reasonable prospects of the 10 per cent dividend being maintained. On the other hand, there was an easier tendency in shares of companies connected with plastics, following talk of increasing competition. De La Rue 5s. ordinary were 43s. 9d. at which the yields exceeds 5½ per cent on last year's 50 per cent dividend. British Industrial Plastics 2s. shares were 8s. 7½d., and British Xylonite £6½.

Iron and steels have been firm, the good yields continuing to attract buyers. United Steel were 30s. 3d., Dorman Long 31s. 6d., Guest Keen 50s., and Stewarts & Lloyds strengthened to 57s. on the financial results. Awaiting the past year's figures, Babcock & Wilcox were higher at 71s. 9d. Elsewhere, Clarke Chapman have improved to 58s. 9d. Associated Cement were 73s., but British Plaster Board eased to 24s. 9d. In other directions, Courtaulds at 40s. 4½d., and British Celanese at 22s. have been quite well maintained.

Glaxo Laboratories were £17½. and British Drug Houses 5s. shares 11s. 3d. In both these cases yields are small, and in respect of the current year dividends will be merely maintained owing to the voluntary limitation plan. Later on, however, payments in excess of last year's rates should be in prospect, according to current market assumptions. Boots Drug were steady at 53s. 9d., Beechams deferred eased to 22s. at which there is a yield of 4½ per cent. Sangers held their rise to 34s. 9d. British Glues & Chemicals 4s. shares were 22s. 6d. yielding 4½ per cent on the basis of last year's 25 per cent dividend. Oils lost ground with Anglo-Iranian down to £8 on the closing of the Haifa pipe-line and Shell only 75s., but very little selling was in evidence. The decision to terminate the

Petroleum Board was expected and therefore had no particular effect in the market.

British Chemical Prices

Market Reports

BUSINESS on the industrial chemicals market during the past week has been fairly active on home trade account and new bookings have covered a wide range of light and heavy products. Pressure for contract delivery specifications continues to be experienced by producers and the position in several directions is by no means free of difficulty. Inquiries on export account are being maintained on a good scale. Apart from the recent advance of 12s. 6d. per ton in the controlled price of ground sulphur, there have been no price alterations of importance, and values throughout the market remain on a firm basis. Sodium and potassium bichromates, now de-controlled, are unchanged and steady, and a persistent call for chlorate of soda and soda ash is reported. Paint raw materials and rubber chemicals are in strong request and other items in steady demand include hydrogen peroxide, formaldehyde and acetic acid. There is again little of fresh interest to report on the coal-tar products and the overall demand continues to be in excess of what is available. Pitch is an active market and fair quantities are being taken for shipment.

MANCHESTER.—A persistent flow of inquiries covering a wide range of products has been reported during the week on the Manchester chemical market. Caustic soda, soda ash and other alkali products are meeting with a brisk demand from the home textile and other consuming trades, and the ammonia and potash chemicals, as well as many other products, are wanted in substantial quantities. Shippers are also pressing for the completion of export orders placed some time ago and new overseas business has been placed. There is pronounced pressure for deliveries of fertiliser materials. In the tar products market plenty of business is offering and only in one or two sections can the demand be described as dragging.

GLASGOW.—Business in Scotland during the week has generally been very quiet indeed and the chemical trade has been no exception. No particular reason can be given to account for these conditions. Considerable conservatism is being shown by firms in ordering supplies of materials for experimental purposes. In the export market conditions have also been unfruitful as a whole, although a number of substantial orders have been booked.

India Plans Chemical Industries

From a Special Correspondent

RECOMMENDATIONS for integrating the caustic soda, hydrochloric acid, and bone-phosphate industries of India were made recently in an inaugural address at the 14th annual conference of the All-India Soap Manufacturers' Association at Calcutta by Sir J. C. Gosh, Director-General of Industries, Government of India.

He suggested that the managements of chemical concerns that the technical feasibility and the economic prospects of these industries should be carefully worked out, and immediate action taken if the risk involved in starting this industry was not too great. Serious consideration should be given to the proposal to set up a co-operative research association.

Prospects for making cheap salt in a particular locality of the West Bengal sea board were very bright. This project, he added, would mean a saving in transport charges which amounted to Rs.35 per ton of salt from its source of production in Kathiawar ports to Calcutta, and should be immediately implemented.

* * *

In reply to a question in the Indian Dominion Parliament at New Delhi, Dr.

S. P. Mookerjee said that the Government considered that the dyestuff industry was one of those industries in which the State would not hesitate to step in if it became necessary.

The report of the Dyestuff Exploratory Committee contained a plan for the establishment of an Indian dyestuff industry within a period of 15 to 20 years, at a total cost of Rs.25 crores. In accordance with the recommendations of the committee, research was now in progress under the auspices of the Council of Scientific and Industrial Research.

* * *

Reference to the poor development of the chemical industry in India was made by Dr. S. C. Banerjee in a speech to the ILO Industry Committee on Chemicals meeting in Paris recently. Due to extreme neglect on the part of the foreign Government, he said, output of the country was so poor that India was deficient in the production of food-stuffs. The present National Government, however, had finished a factory for ammonium sulphate from gypsum in the quickest possible time, and when completed it was hoped to be able to meet a large part of the demand for fertilisers in India.

NEXT WEEK'S EVENTS

MONDAY, MAY 3

Society of Chemical Industry. (London Section.) Rooms of the Chemical Society, Burlington House, Piccadilly, W.1, 6.30 p.m. Annual general meeting. Dr. B. A. Southgate: "The Treatment and Disposal of Waste Waters from Industry."

Chemical Society. (Leeds Section.) Chemistry Department, University, Leeds, 6.30 p.m. Prof. L. Pauling: "The Valence of Metals and the Structure of Intermetallic Compounds."

TUESDAY, MAY 4

Society of Chemical Industry. (Chemical Engineering Group.) Geological Society, Burlington House, Piccadilly, W.1, 5.30 p.m. J. N. Pring: "Modern Propellants Employed in British Ordnance."

Electrodepositors' Technical Society. James Watt Memorial Institute, Great Charles Street, Birmingham, 8. N. Christie: "Modern Nickel and Chromium Plating Practice."

TUESDAY, MAY 4, and WEDNESDAY, MAY 5

Society of Chemical Industry, Chemical Society and Royal Institute of Chemistry.

(Aberdeen and N. Scotland Sections.) Tuesday. Visits to laboratories. 2.15 p.m. Symposium on The Analysis of Traces of Ultra Micro Quantities. Chemistry Department, Marischal College, Dr. C. L. Wilson, R. L. Mitchell, G. C. W. Milner and T. G. Brady. Wednesday. 9.45 a.m. Dr. C. L. Wilson: "The Microscope as a Chemical Tool."

WEDNESDAY, MAY 5

Royal Society of Arts. John Adam Street, Adelphi, W.C.2, 2.30 p.m. Dr. F. G. Mann: "Recent Advances in Stereochemistry." (Pope Memorial Lecture.)

THURSDAY, MAY 6

Chemical Society. (London Section.) Royal Institution, Albemarle Street, W.1, 7.30 p.m. Sir John Lennard-Jones: "The Molecular Orbital Theory of Valency." (Manchester Section.) Chemistry Department, University, Manchester, 6.30 p.m. Prof. L. R. Pauling: "The Chemical Bond."

Royal Institute of Chemistry. (Sheffield, S. Yorkshire and North Midlands Section.) Applied Science Department, The University, Sheffield, 6 p.m. Annual general meeting.

Patent Processes in Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted will be obtainable, as soon as printing arrangements permit, from the Patent Office, Southampton Buildings, London, W.C.2 at 1s. each. Higher priced photostat copies are generally available.

Complete Specifications Accepted

Derivatives of piperonyl aldehyde and compositions containing them.—E. P. Newton. (Poor & Co.) Sept. 14, 1945. 599,752.

Process for the production of useful porous articles consisting essentially of polymers of tetrafluoroethylene. E. I. Du Pont de Nemours & Co. Sept. 20, 1944. 599,580.

Method of refining glyceride oils.—Anderson, Clayton & Co. March 27, 1945. 599,595.

Compositions comprising organo-lithium products.—H. H. Gordon. (Foote Mineral Co.) Sept. 24, 1945. 599,758.

Production of chemical compounds.—E. I. Du Pont de Nemours & Co. Sept. 25, 1944. 599,762.

Preparation of 6-methoxy-quinoline-N-oxide.—E. Lilly & Co. Oct. 19, 1944. 599,768.

Cyanine dyes and photographic materials containing them.—Kodak, Ltd. (Eastman Kodak Co., and G. H. Keyes.) Oct. 6, 1945. 599,712.

Substituted dicyandiamides.—I.C.I., Ltd., T. S. Kenny, and A. G. Murray. Jan. 30, 1946. 599,722.

Processes for the production of protective coatings on metal surfaces.—Walterisation Co., Ltd., R. F. Drysdale, and R. W. Parker. May 13, 1946. 599,784.

Processes for the production of protective coatings on the surfaces of metals and alloys.—Walterisation Co., Ltd., R. F. Drysdale, and R. W. Parker. May 13, 1946. 599,785.

Method of treating gaseous bodies.—Commonwealth Engineering Co. of Ohio. June 25, 1943. 599,604.

Use of liquid alkylation catalysts in the alkylation of hydrocarbons.—Anglo-Iranian Oil Co., Ltd., and A. P. Shearer. Sept. 22, 1943. 599,906.

Firing metallurgical furnaces.—United Steel Companies, Ltd., and G. A. V. Russell. Jan. 31, 1944. 599,846.

Preparation of quaternary nitrogen salts of melamine-formaldehyde condensation products.—American Cyanamid Co. Feb. 12, 1943. 599,847.

Halogenation of organic compounds.—Compagnie Française de Raffinage. March 31, 1944. 599,864.

Manufacture of azo-dyestuffs capable of being chromed.—J. R. Geigy, A.G. Sept. 20, 1944. 599,867.

Modified rubber compositions.—Wingfoot Corporation. June 18, 1945. 599,937.

Soluble sulphanilamide derivatives and process of preparing same.—Hoffmann-La Roche, Inc. Aug. 16, 1944. 599,967.

Carbons.—L. Wickenden. Dec. 2, 1944. 599,949.

Production of metal hydrides.—Metal Hydrides, Inc. Sept. 30, 1944. 599,972.

Treatment of high alpha-cellulose pulp to increase the chemical reactivity thereof.—Rayonier, Inc. Dec. 5, 1944. 599,973.

Production of ethers of phenyl methyl carbinol, and its homologues.—Distillers Co., Ltd., D. Faulkner, and F. E. Salt. Sept. 27, 1945. 599,987.

1-Substituted-2, 5-diketo-7-methyl-pyrimido-pyrazols, and process of preparing the same.—General Aniline & Film Corporation. Nov. 17, 1944. 599,891.

Thermionic valve oscillators.—Ericsson Telephones, Ltd., and F. W. Hopwood. Nov. 24, 1945. 599,963.

Curing polymeric materials.—I.C.I., Ltd., D. A. Harper, and W. F. Smith. Oct. 2, 1946. 599,905.

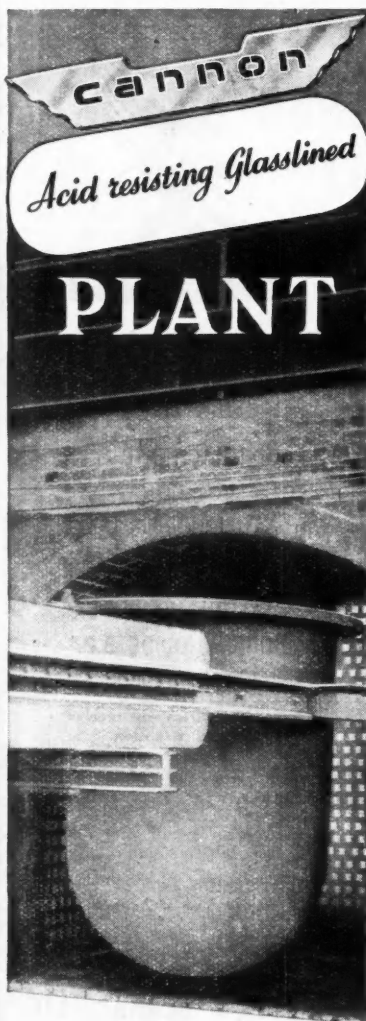
Calcium Carbide

Australia Requires 17,000 tons a Year

ESTIMATED future demands for calcium carbide in Australia are stated by the Dominion Tariff Board to be approximately 17,000 tons, of which 14,000 tons will be required by the welding and lighting industry, and 3000 tons by the chemical industry. The only home producer is Australian Commonwealth Carbide Co., Ltd., Tasmania. This company's plant, which is situated at Electrona, near Hobart, is capable of producing 9800 tons annually, an output which has been reduced in the last two years by 50 per cent owing to shortage of raw materials, particularly carbon.

Pre-war production at the factory reached 3000 tons per year, of which 7000 tons were used locally, and 1000 tons exported. Imports were obtained from Canada, Norway and Sweden.

According to a Tariff Board report, the demand for calcium carbide for welding and lighting has doubled since the war, while more than 500 tons a year are needed for the manufacture of acetylene black. Imperial Chemical Industries of Australia and New Zealand, Ltd., requires about 600 tons a year for trichlorethylene production, as well as additional quantities for polyvinyl chloride.



Firing the glass lining of a
1000-gallon mixing pan.
 The purity of your product
 depends on perfect plant.

CANNON IRON FOUNDRIES LTD.
 DEEPFIELDS, BILSTON, STAFFS.

The determination of water

The method for the titrimetric determination of water suggested by Karl Fischer (*Angew. Chem.*, 1935, 48, 394) is widely applicable and T. G. Bonner (*Analyst*, 1946, 71, 483) has evolved a procedure which obviates most of the difficulties previously associated with it.

Karl Fischer Reagent can now be supplied in the form of two separate solutions, equal volumes of which are mixed to give the actual reagent, while the solution of water in methyl alcohol-dioxan mixture and the specially dried dioxan are also available.

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SPEAKING at the annual meeting of the United Kingdom Provident Institution (of which he is chairman) on April 21, Sir Ernest Benn, the chief proprietor of THE CHEMICAL AGE, said new business figures of sums assured and premium income had made spectacular advances and constituted an all-time record. The life assurance and annuity fund had increased by £700,000, and investments and properties had a market value very considerably above the figures entered in the balance sheet.

In making a 20 per cent increase on the last rate of bonus, he said—by paying bonus on bonus, or compound bonus—the oldest policies would now be increased in respect of the last three years by no less than 80s. per cent per annum upon the original sums assured.

Of the effect of politics on business, Sir Ernest said: "In recent years, especially since the war, government here, and elsewhere, has tended to pass into the hands of the non-believers in profit; and a considerable part of the business of the world is now conducted by those who have nothing to gain from success, or to lose by failure. Values, previously thought to be essential, have been exchanged for theories, now undergoing the test of practical trial. If we could afford the luxury of philosophy we might say with Isaac Newton: 'These are curiosities of little or no moment to the understanding of the phenomenon of nature'. As, however, we cannot feed on philosophy, we have to bend our brains to the curiosities of control, and talk of 'bulk' sale and purchase, to screen the serious shrinkage in both processes."

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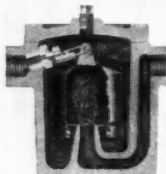
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